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An analysis of Department of Defense policy and guidance for implementation of Performance-Based Logistics

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MONTEREY, CALIFORNIA

THESIS

**AN ANALYSIS OF DEPARTMENT OF DEFENSE POLICY
AND GUIDANCE FOR IMPLEMENTATION OF
PERFORMANCE-BASED LOGISTICS**

by

Michael S. Ewer

September 2015

Thesis Advisor: Charles K. Pickar
Second Reader: Mark M. Rhoades

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13. ABSTRACT (maximum 200 words)

The goal of this thesis is to improve Department of Defense (DOD) policy and guidance to help program managers and product support managers effectively employ Performance Based Logistics (PBL) as a product support strategy. If properly utilized, a PBL approach can reduce a weapon system's life cycle cost, increase its availability to the warfighter, and reduce the logistics footprint traditionally required to sustain it. This thesis contains a thorough analysis of the most current and relevant DOD policies and guidance to determine if it adequately supports implementation of PBL. A model is presented to aid readers through the analysis of the selected documentation to identify areas where policy refinement and additional guidance may improve understanding and awareness of PBL. This thesis makes recommendations on closing the identified information gaps with the aim to strengthen PBL policies and procedures. Major findings that trend across the reviewed documents or pose significant problems for implementing PBL are addressed with recommendations. The desired result of this research is to improve existing PBL policy and guidance in order to ultimately provide affordable and effective weapons systems in the defense of our nation.

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AN ANALYSIS OF DEPARTMENT OF DEFENSE POLICY AND GUIDANCE FOR IMPLEMENTATION OF PERFORMANCE-BASED LOGISTICS

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

The goal of this thesis is to improve Department of Defense (DOD) policy and guidance to help program managers and product support managers effectively employ Performance Based Logistics (PBL) as a product support strategy. If properly utilized, a PBL approach can reduce a weapon system's life cycle cost, increase its availability to the warfighter, and reduce the logistics footprint traditionally required to sustain it. This thesis contains a thorough analysis of the most current and relevant DOD policies and guidance to determine whether they adequately support implementation of PBL. A model is presented to aid readers through the analysis of the selected documentation to identify areas where policy refinement and additional guidance may improve understanding and awareness of PBL. This thesis makes recommendations on closing the identified information gaps with the aim to strengthen PBL policies and procedures. Major findings that trend across the reviewed documents or pose significant problems for implementing PBL are addressed with recommendations. The desired result of this research is to improve existing PBL policy and guidance in order to ultimately provide affordable and effective weapons systems in the defense of our nation.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACAT	acquisition category
Am	materiel availability
Ao	operational availability
ASD (L&MR)	Assistant Secretary of Defense for Logistics and Materiel Readiness
BBP	Better Buying Power
BCA	business case analysis
BSIG	Business Senior Integration Group
CAE	component acquisition executive
CDRL	contract data requirements list
CLS	contractor logistics support
CPIF	Cost Plus Incentive Fee
DAG	Defense Acquisition Guide
DAU	Defense Acquisition University
DLA	Defense Logistics Agency
DMSMS	diminishing manufacturing sources and materiel shortage
DOD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DPAP	Defense Procurement and Acquisition Policy
FFP	Firm Fixed Price
FPIF	Fixed Price Incentive Fee
GAO	Government Accountability Office
ICS	interim contractor support
ILA	independent logistics assessment
IPT	Integrated Product Team
LCC	life cycle cost
LCSP	Life Cycle Sustainment Plan
LRT	logistics response time
MDA	milestone decision authority

MDAP	major defense acquisition program
MOA	memorandum of agreement
MOU	memorandum of understanding
MTTR	mean time to repair
MTBF	mean time between failures
NDAA	National Defense Authorization Act
O&M	operation and maintenance
O&S	operating and support (cost), Operations and Support (life cycle)
OEM	original equipment manufacturer
OSD	Office of the Secretary of Defense
PBA	performance based agreement
PBL	performance based logistics
PCO	procuring contracting officer
PHS&T	packaging, handling, storage & transportation
PM	program manager
POM	program objective memorandum
PSA	product support arrangement
PSI	product support integrator
PSM	product support manager
PSP	product support provider
RAM	reliability, availability and maintainability
SCM	supply chain management
SLA	service-level agreement
SML	sustainment maturity level
TLCLS	total life cycle logistics support
TLCSM	total life cycle system management
U.S.	United States
USD (AT&L)	Undersecretary of Defense for Acquisition, Technology and Logistics

EXECUTIVE SUMMARY

The objective of this thesis is to improve Department of Defense (DOD) policy and guidance and better assist program managers and product support managers to effectively employ Performance Based Logistics (PBL) as a product support strategy. If properly utilized, a PBL approach can reduce a weapon system's life cycle cost, increase its availability to the warfighter, and reduce the logistics footprint traditionally required to sustain it. This is not a new concept, as it has already been used effectively by the commercial aviation industry to maintain aircraft fleet readiness.

This thesis contains a thorough analysis to determine if the most current and relevant DOD policies and guidance adequately support implementation of PBL. A total of six different DOD-level policy and guidance documents were reviewed. Four of the six are considered policy documents. They primarily establish PBL policy and provide a limited amount of background and definition in support of the direction. The other two documents are the *Product Support Manager (PSM) Guidebook* (2011) and the *Performance Based Logistics (PBL) Guidebook* (2014), both published by the Assistant Secretary of Defense (Logistics and Materiel Readiness) (ASD (L&MR)). They are guidance documents and do not provide any direction or policy but instead supplement the PBL-related policies by adding more detailed information and guidance on PBL and its implementation. Although numerous PBL-related policy and guidance documents exist at the lower DOD component or services level, the scope of this thesis focused on the DOD-level documents, as they are both abundant and comprehensive for the analysis performed.

The methodology of the research was to develop a model using a systems engineering approach for a functional needs analysis, starting with the need, "Implement PBL," thus generating a graphic containing all of the elements/requirements needed to implement PBL. The model was built without referencing any current policy or guidance documents so as not to inject any bias. The model decomposed each high level functional need down to the appropriate lowest level in order to capture all pertinent functions required to enable implementation of the PBL concept. This model is presented for each

of the reviewed documents to aid readers through each document analysis and identify areas where policy refinement and additional guidance may improve understanding and awareness of PBL.

With the aid of the model, information gaps that could hinder effective PBL implementation were identified for each of the reviewed documents. The model presented a graphic depiction of where each of the documents was deficient by highlighting the inadequately addressed element in red. In a few instances, an element was mentioned but the document failed to address it in a useful manner for employing PBL. These element boxes were highlighted in yellow. All elements that were adequately addressed were highlighted in green. Five of the six reviewed documents contained informational gaps. Only the *PBL Guidebook* (2014) addressed all of the elements in the model, thus identifying that document as the single best source of information for PBL.

Recommendations were made in this thesis for closing the identified information gaps with the aim to strengthen PBL policies and procedures. Each identified gap is accompanied with a corresponding recommendation to correct or improve the deficiency.

Major findings that trended across several of the reviewed documents or posed significant problems for implementing PBL were also addressed with recommendations. The three major findings included inconsistencies between PBL policy and guidance documents, the need for determining applicability or feasibility of PBL, and lack of sufficient examples of PBL. The first major finding is especially troublesome. Three of the four policy documents direct the use of PBL. The one remaining policy document and two guidebooks indicate that PBL may not be appropriate for all product support needs. Without clear and unequivocal direction on whether PBL is mandatory or not, it is confusing and difficult to understand whether program managers and product support managers will be held accountable for employing PBL. Thus, unless changes are made, existing DOD policies and guidance do not provide a clear path to enable PBL implementation.

Additional research topics, that were either beyond the scope of this thesis or were discovered during this research, were recommended for future exploration. The desired

result of the research performed in this thesis is to improve existing PBL policy and guidance in order to ultimately provide affordable and effective weapons systems in the defense of our nation.

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Assistant Secretary of Defense (L&MR) (ASD (L&MR)). 2011. *Product Support Manager Guidebook*. Washington, DC: Assistant Secretary of Defense (L&MR), April. http://www.dau.mil/publications/publicationsDocs/PSM%20Guidebook%20April%202011.pdf

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I. INTRODUCTION

A. CONCEPT

The objective of this thesis is to identify and seek to improve potential areas where policy and guidance could be strengthened or clarified to improve implementation of PBL in the future. This thesis analyzes the documentation and policies that currently exist governing the implementation of performance based logistics (PBL) to Department of Defense (DOD) acquisitions. The analysis utilizes a new model to review the comprehensiveness, adequacy and applicability of policies, guidance, and documentation that address the implementation of PBL based system support.

This thesis explores the concepts, guidance, and policies that aim to help DOD acquisition program managers and logisticians effectively implement PBL in weapon systems acquisitions. In addition, future areas of research that may also help improve or facilitate implementation of PBL across DOD weapon systems are proposed.

B. BACKGROUND

In order to understand what PBL is and how it works, it is critical to understand that PBL has been the DOD's preferred strategy to obtain product support since the *Quadrennial Defense Review* report of 2001 (Department of Defense 2001). It is also important to note that planning for product support happens throughout a system's life cycle, not just at the point of delivery to the warfighter. This section will define product support and explain why product support planning throughout a system's life cycle is paramount.

Product support is a significant portion of a weapon system's total life cycle. *DODD 5000.01* (2007) continues to state:

> The Program Manager (PM) shall be the single point of accountability for accomplishing program objectives for total life cycle systems management, including sustainment…PMs shall consider supportability, life cycle costs, performance, and schedule comparable in making program decisions. Planning for Operations and Support and the estimation of total ownership costs shall begin as early as possible.

Supportability, a key component of performance, shall be considered throughout the system life cycle. (Under Secretary of Defense (AT&L) 2007, 10)

Figure 1 is taken from the *PBL Guidebook* (2014), published by the office of the Assistant Secretary of Defense for Logistics and Materiel Readiness (ASD (L&MR)). It shows the phases of the DOD Acquisition process and when key logistics support planning events and milestones occur in relation to it. This highlights in a weapon system's development how early supportability must be considered in order to reduce life cycle cost and logistical impacts. Supportability is built into the system during the "Plan for support" and "Design for support" phases of the life cycle. It can be difficult and costly to change or improve supportability after the design is finalized in most cases (Secretary of Defense 2014). Thus, it is critical to ensure that supportability is adequately addressed during a weapon system's design phases.

Figure 1.   Key Support Activities by Phase
(from Department of Defense 2013, 17)

Although the PM has life cycle management responsibility of a system, a Product Support Manager (PSM) helps the PM build a strategy for supporting the system. The *PSM Guidebook* (2011) states:

> In 2009, Congress officially established the PSM as a key leadership position, distinct from the PM, who reports directly to the PM for ACAT 1 and 2 programs. The PM is charged with delivering Warfighter required capabilities while the PSM, working for the PM, is responsible for developing and implementing a comprehensive product support strategy and for adjusting performance requirements and resource allocations across Product Support Integrators (PSIs) and Product Support Providers (PSPs) as needed to implement this strategy. (ASD (L&MR) 2011b, 11)

Figure 2 is provided to show the roles, relationships, responsibilities and business agreements among the various key product support stakeholders.

Figure 2.   Key Product Support Stakeholders (from ASD (L&MR) 2011b, 17)

Product support is the sustainment aspect of the Operations and Support phase in a weapons systems life cycle. It is further defined as:

> *Product Support*, a key life cycle management enabler, is the package of support functions required to deploy and maintain the readiness and operational capability of major weapon systems, subsystems, and

components, including all functions related to weapon systems readiness. The package of product support functions related to weapon system readiness and which can be performed by both public and private entities includes the tasks that are associated with the Integrated Product Support (IPS) Elements. These elements are an expansion of the Integrated Logistics Support (ILS) elements and should be considered during the development, implementation, and subsequent revalidation of the product support strategy. Product support and system engineering activities must be integrated to deliver an effective and affordable product support package. PSM involvement early in design is a critical part of ensuring a supportable and affordable system. (ASD (L&MR) 2011b, 10)

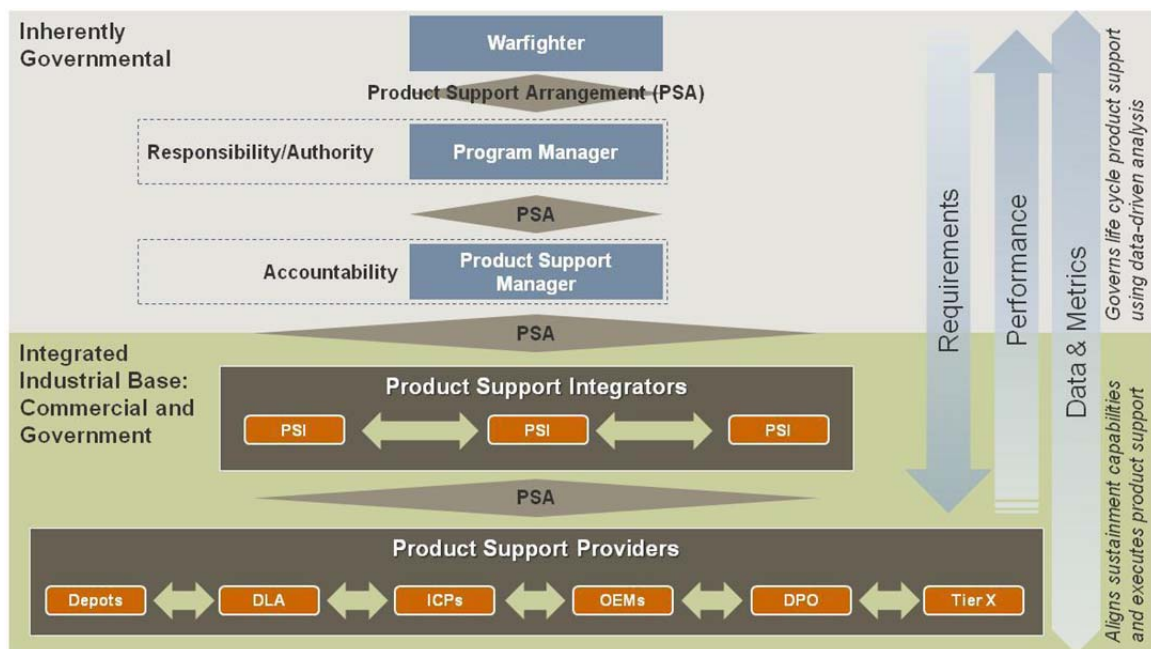Operating and Support (O&S) costs frequently comprise about 60–70% of a weapon system's life cycle costs (ASD (L&MR), 2011b). Figure 3 is an illustration of the various costs associated with each phase of a weapon system's life cycle. Note that, on average, the O&S phase of a life cycle typically costs the greatest of all phases, with some exceptions. Hence, it is important to seek and employ optimal management techniques and support concepts, such as a PBL approach, to lower O&S expenditures and effectively make our systems more affordable.

Figure 4 is included to show selected system types and their respective O&S costs as a percentage of their total life cycle costs. Notice in Figure 4 that space systems, as an exception, typically have significantly lower O&S costs, at about 15% of total life cycle costs (Secretary of Defense 2014, 2–2). Space systems, such as satellites and associated command and control systems, have high development costs attributed to complex technological requirements for operating in space (Sellers, 2005). More specifically, sustainment costs for space systems are relatively small in proportion to development and procurement costs mainly because much of a space system's upkeep is accomplished through operations. "Finally, in addition to their training, commanding, and data handling duties, the operations team must also maintain the operations systems that support them, such as the complex-communication networks that keep them in touch with their spacecraft. This effort involves routine maintenance at remote-tracking sites, upgrades to control-center hardware and software, and even new relay-satellite links" (Sellers 2005, 640).

Figure 3.　　System Life Cycle Illustration
(from Secretary of Defense 2014, 2–1)
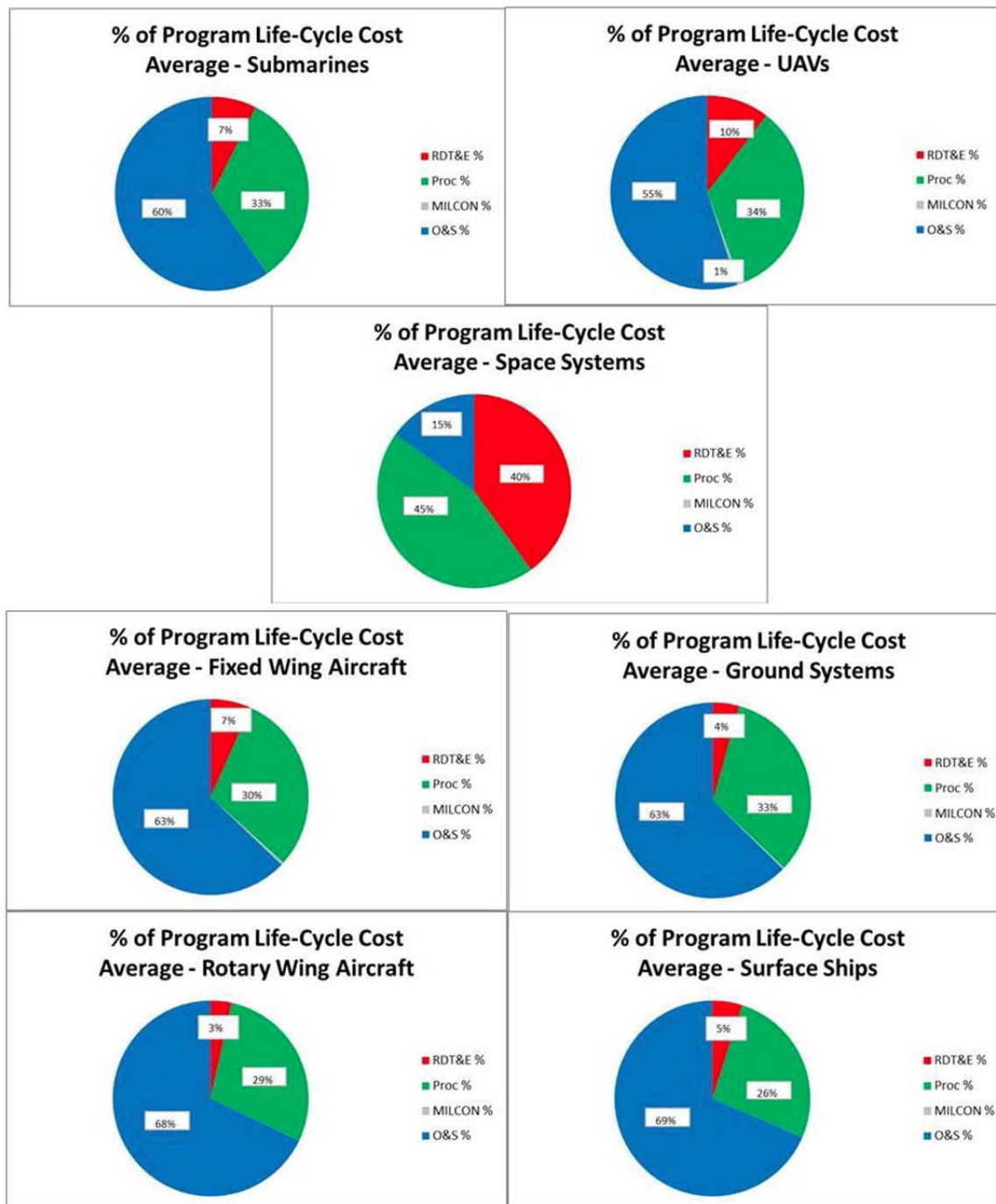
Figure 4.   O&S Costs as Percentage of Total Life Cycle Cost for Various
System Types (from Secretary of Defense 2014, 2–1)

As mentioned previously, the O&S phase is typically the most expensive for
DOD's weapon systems. By using innovative processes, concepts, and methods, such as a
PBL approach, it is possible to either improve a system's reliability/availability, reduce

cost of support, or a combination thereof. For the purposes of this thesis, any mention of cost reduction will refer to the reduction of support costs due to application of innovative processes, concepts and methods to reduce the cost of support while maintaining or improving current supportability.

Traditionally, DOD policies and practices of sustainment have focused on procurement of parts, services and other logistics requirements in sufficient quantities to ensure maximum availability of the supported system. This is commonly referred to as a transaction-based support system (Gansler and Lucyshyn 2006).

> This meant that DOD customers (military services and agencies) focused on ensuring that they had enough spare parts and inventory to meet any need or requirement (often referred to as a "just in case" system). This approach tended to increase demand (the whiplash effect), compounded by a "supply push," resulting in large inventories. The customer also bore the costs and risks for forecasting, ordering and maintaining inventory, warehousing, managing obsolescence, transportation, reliability analysis, configuration management and field engineering. (Gansler and Lucyshyn 2006, 3)

Though this approach worked for the DOD in the Cold War era, this is not the most cost-effective way of supporting systems in general. During recent times, as the world's major super power, the United States (U.S.) and its armed forces has not faced a conventional threat such as the Soviet Union in the Cold War. The U.S. armed forces today face a nonconventional threat and are more likely to encounter new conflicts waged against different adversaries in challenging environments across the globe. This means the previous support strategy of amassing large inventories of spares to cover required repairs is no longer efficient or effective.

Presently, DOD and its military branches are transitioning logistics support from transaction based methods to PBL as the preferred method of product support for the 21st century (ASD (L&MR) 2014). Emphasis is now given to consideration of logistics early in the acquisition life cycle and consideration of product support strategies and techniques that will result in a lower total life cycle cost and improved sustainment performance parameters.

The origin of PBL in DOD, or at least statements implying a new product support strategy, appeared as early as 1998, as articulated in Section 912(c) of the National Defense Authorization Act (NDAA) in the year FY 1998 and the April 1998 Secretary of Defense Report to Congress: Actions to Accelerate the Movement to the New Workforce Vision in response to Section 912(c) of the NDAA for FY 1998 (Kobren 2009, 259). PBL was originally a commercial approach to providing aircraft readiness for commercial jetliners (ASD (L&MR) 2014, 8). "The Services originally implemented PBL to improve system readiness. More recently, PBL has been implemented to deliver needed reliability and availability, reduce total cost, and encourage and reward innovative cost reduction initiatives" (ASD (L&MR) 2014, 9).

Other highlights critical to the establishment of PBL are captured by Bill Kobren, as he states, "The FY 1998 NDAA became the basis for the July 1999 Product Support for the 21st Century (PS21) report, where it documented the DOD's integrated strategy to implement reengineered product support processes. Follow-up PS21 reports were published in 2000 and 2001. The September 2000 PS21 report highlighted the results of efforts mentioned in previous reports, summarized completed actions to address structural issues, and identified remaining tasks and milestones. A year later, the November 2001 PS21 resulted in the new document, A Program Manager's Guide to Buying Performance" (Kobren 2009, 259).

> PBL guidance was also codified in the May 2003 DOD Directive 5000.01, The Defense Acquisition System, and DOD Instruction 5000.02, Operation of the Defense Acquisition System. It was further supported by detailed implementation guidance contained in Chapter 5 of the Defense Acquisition Guidebook (DAG) in 2006, the issuance of Performance Based Logistics: A Program Manager's Product Support Guide in March 2005, and numerous related Office of the Secretary of Defense (OSD) and Service policies, instructions, regulations, and guidebooks. (Kobren 2009, 259)

Training was also created to help implement PBL. "At OSD direction, DAU also created a series of PBL-related learning courses, including Continuous Learning Module (CLM 011) Performance Based Logistics (PBL), LOG 235A (now LOG 235) Web-based PBL training, LOG 235B (now LOG 236) case-based classroom PBL training, and

establishment of the Web-based PBL toolkit (https://acc.dau.mil/pbl) in 2005" (Kobren 2009, 259).

The DOD looked to the Defense Acquisition University (DAU) for help in implementing PBL. As DAU's Bill Kobren noted, "consistent with the Defense Business Board recommendation to leverage DAU to accelerate PBL implementation and to establish a DOD PBL Center of Excellence" (DAU 2005), the Assistant Deputy Under Secretary of Defense, Logistics Plans and Programs designated DAU as a PBL "Center of Excellence" (DAU 2005) to expand PBL learning assets, performance support, workshops, rapid deployment training, and "serve as a nexus for information cross-flow, liaison, and interface between and among the DOD components, the Defense Industry, and other Academic institutions on PBL applications and thought leadership" (Kobren 2009, 259).

To encourage increased implementation of PBL, DOD sought to incentivize PBL implementers. DAU's Bill Kobren noted this by stating, "In fact, the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (USD (AT&L)) was so serious about implementing PBL, the USD (AT&L) established an annual DOD-level awards program in 2005 to recognize outstanding system, sub-system, and component-level PBL strategies across the DOD. This compendium of policies, guidance, initiatives, training structures, and program recognition attests to the fact that PBL is clearly not a passing fad" (Kobren 2009, 259).

The definition of PBL differs slightly as defined by various sources. Here are two comprehensive examples:

DAU's *Performance Based Logistics: A Program Manager's Product Support Guide* (2005), defines PBL as "the purchase of support as an integrated, affordable, performance package designed to optimize system readiness and meet performance goals for a weapons system through long-term support arrangements with clear lines of authority and responsibility" (DAU 2005, 1–1).

According to the *PBL Guidebook*, published by ASD L&MR in May 2014 "PBL is synonymous with performance-based life cycle product support, where outcomes are

acquired through performance-based arrangements that deliver Warfighter requirements and incentivize product support providers to reduce costs through innovation. These arrangements are contracts with industry or intra-governmental agreements" (ASD (L&MR) 2014, 8).

PBL's key tenets are:

- **It is a performance (outcome) based arrangement**—this tenet can be restated as an expectation of seeing a desired outcome based on industry/ support provider's innovation/decision making. This entails allowing the support provider to make internal decisions on how to meet performance objectives (ASD (L&MR) 2014).

- **It incentivizes the support provider to enhance performance or reduce the cost/schedule of the effort to maintain performance**—this tenet ties support provider profits or process efficiencies with increased readiness and, in some cases, a reduced logistics footprint and lower costs. The other side of this tenet also exposes government agencies owning the system to a degree of risk based on the technical maturity of the system (ASD (L&MR) 2014). Do we have policies specifying at what technical maturity is PBL good to use? Or on systems with no precedent, do we have policy/guidance that specifies how to calculate potential risks against cost savings?

- **Performance is measured by appropriate quantifiable metrics**—this tenet addresses the use of appropriate metrics, as examples, system or component availability, logistics lead time, mean time between failure, or mean time to restore functionality. The chosen metrics and associated performance targets should be set to be within the support provider's capabilities and scope of responsibility/influence (ASD (L&MR) 2014).

- **PBL arrangements are typically long term arrangements**—this tenet identifies the concept that in order for a support provider to want to invest up-front to better meet performance goals, the arrangement should allow enough time for innovations and improved efficiencies to take effect and pay off. In other words, if the arrangement is only for two years, for example, a support provider will more likely be less willing to invest significant capital or resources to improve processes or material to increase performance, especially if they know that in two years they could potentially lose the work. They will also have less time to reap the rewards of any improvements, thus reducing their incentive or profit potential. Therefore, shorter term duration arrangements can expect to see less investment and innovation, or status quo. In contrast, longer term arrangements, like five years or more, may encourage support providers to invest and innovate more up-front, which would benefit the end user with

better system readiness and increase the provider's profits by reducing their costs over the duration of the arrangement. Lastly, longer term arrangements may allow for an environment where a relationship of trust and an understanding of customer expectations between the PSM and PSP can be established and built over time (ASD (L&MR) 2014).

In the last 15 years or so, the DOD has introduced many new initiatives to move away from traditional support strategies in order to encourage implementation of PBL. The following documents are the most recent and important sources for guidance addressing PBL and its implementation in the DOD. A detailed analysis of the PBL-related content of the documents listed below will be performed in Chapter IV of this thesis. These important documents supporting implementation of PBL in the DOD are as follows:

- *DODD 5000.01* (November 20, 2007)

- *DODI 5000.02* (January 7, 2015)

- USD (AT&L) Memorandum "*Better Buying Power 3.0*" (April 9, 2015)

- ASD (L&MR) *PBL Comprehensive Guidance* (November 22, 2013)

- ASD (L&MR) *PBL Guidebook* (May 27, 2014)

- ASD (L&MR) *Product Support Manager Guidebook* (April 2011)

C. RESEARCH OBJECTIVES

The research objectives of this thesis are as follows:

- Conduct an in-depth analysis of the documentation and policies that currently exist governing the implementation of PBL to DOD acquisitions.

- Identify the significant gaps in DOD policy and guidance documentation that may be problematic for implementation of PBL.

- Identify and recommend possible changes to policy and guidance that could help improve implementation of PBL by DOD logisticians and program managers.

D.   RESEARCH QUESTIONS

The research in this thesis addresses and strives to provide answers to the following questions:

- Are current and applicable DOD policy and guidance documents adequate to facilitate PBL implementation?

- What informational gaps exist in the current DOD policies and guidance that may pose issues for implementing PBL?

- What changes and recommendations can be proposed to close these informational gaps to better assist DOD program managers and logisticians in implementing PBL?

E.   ASSUMPTIONS, SCOPE AND LIMITATIONS

The following assumptions were made in this thesis for the purpose of controlling scope and identifying limitations in order to maintain objectivity of the research performed:

- This thesis assumes that the reader understands the basic principles and policies governing DOD system acquisition in general.

- This thesis does not intend to evaluate the effectiveness of PBL in meeting its intended goals (e.g., reducing support costs, decreasing logistics footprint, or increasing system availability/sustainability). This thesis is a comprehensive evaluation of the policies, guidance, and documentation pertinent to PBL that can improve and standardize the implementation of PBL by program managers and product support managers across the DOD.

- Resource requirements needed to implement PBL, such as sufficient funding in correct appropriation types, are out of scope of this thesis, as it is normally provided by DOD via the Program Objective Memorandum (POM) process, as needed. Fiscal constraints are a real concern facing the DOD today, but are not a factor for the discussion of whether PBL is adequately addressed and covered in DOD policies and guidance documents. On the other hand, guidance on funding issues and strategies, like paying into a Working Capital Fund or utilizing Life Cycle Cost (LCC) estimates, are essential to implementing PBL and will be considered.

- The thesis assumes that the PBL implementation model developed by the author is new to readers. Therefore, Chapter III will provide a thorough

explanation of the model and how it is used for evaluating the policies and guidance.

- A gap review of only the most recent, available and pertinent DOD policies and guidance with respect to PBL will be presented. New or updated policies or guidance on PBL may have emerged since publication date of this thesis.

- This thesis will identify any informational gaps that may hinder product support managers from effectively implementing PBL.

- This thesis will provide recommendations to improve the effectiveness of DOD documentation toward the goal of implementing PBL.

F.   ORGANIZATION

This thesis is organized as follows: Chapter II provides the approach used to review and identify any informational gaps that may hinder implementation of PBL. In Chapter III, this thesis describes a model that was developed by the author based on a systems engineering approach of developing a functional diagram. This model provides a framework upon which each policy and/or guidance document reviewed in this thesis can be assessed for possible informational gaps that could inhibit effective implementation of PBL. Chapter IV reviews each of the policy and guidance documents selected pertaining to PBL implementation to identify any potential informational gaps and provide recommendations for modifying the documents to better assist in implementation of PBL. Finally, Chapter V concludes with major findings resulting from the research performed and also proposes future areas of research that could further improve the implementation of PBL.

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II. APPROACH

A. DESIGN

In order to conduct a gap analysis of the current guidance and documentation regarding the DOD's implementation of PBL in Chapter IV, this thesis first proposes a systematic PBL implementation model, which is further described in Chapter III. This model is used to assess the completeness of the selected current policy and guidance documents and identify any informational gaps that may exist. Once these gaps have been identified, recommendations will be provided on ways to bridge these gaps as appropriate. This approach does not involve the study of any individuals or organizations, but instead will be based on critical analysis and review of selected current DOD policies and guidance documents. The documents chosen for analysis can all be found on the PBL Community of Practice website on Defense Acquisition University's Acquisition Community Connection website at https://acc.dau.mil. It should be noted that all PBL policy and guidance reviewed in this thesis is at the DOD level and not at the component service level (i.e., Army, Air Force, or Navy) because the amount of DOD level documentation was found to be abundant and appropriate for the scope of this thesis. The documents reviewed in Chapter IV are organized into two groups: Policies and Guidebooks. The documents are as follows:

- *DODD 5000.01* (November 20, 2007) (Policy)

- *DODI 5000.02* (January 7, 2015) (Policy)

- USD (AT&L) Memorandum "*Better Buying Power 3.0*" (April 9, 2015) (Policy)

- ASD (L&MR) *PBL Comprehensive Guidance* (November 22, 2013) (Policy)

- ASD (L&MR) *PBL Guidebook* (May 27, 2014) (Guidebook)

- ASD (L&MR) *Product Support Manager Guidebook* (April 2011) (Guidebook)

B.   DESCRIPTION OF PBL IMPLEMENTATION MODEL

The PBL implementation model presented in this thesis provides the underlying structure for the analysis of each of the policy and guidance documents. This model was developed with a systems engineering approach by creating a functional needs analysis, starting with the need, "Implement PBL." This model was built without referencing any current policy or guidance documents so as not to inject any bias. The model decomposed each high level functional need down to the appropriate lowest level in order to capture all pertinent functions required to enable implementation of the PBL concept. The visual representation of the PBL implementation model was built using Microsoft Visio.

C.   HYPOTHESIS

There are significant information gaps in documentation of PBL policy and guidance that hinder comprehensive implementation across the DOD.

D.   PROCEDURE

In Chapter III, the PBL analysis model is presented as the framework for assessing each selected policy and/or guidance document. In Chapter IV, this thesis will review in depth the selected policies and guidance literature and identify informational gaps for each of the elements represented in our PBL analysis model. This thesis will also include a graphical representation of each of the model elements that are not addressed or contained in each document. Each document used in this thesis was organized in Chapter IV into two groups by whether it was a policy document or a reference guidebook. Possible ways to fill the informational gaps for each group of documents will be identified and recommended. Finally, recommendations and conclusions are presented in Chapter V to summarize the major findings and suggest further areas of research.

III. PBL IMPLEMENTATION MODEL

A. BACKGROUND ON PBL IMPLEMENTATION MODEL

This chapter explains the concept and methodology used to create the PBL implementation model and how it aids in assessing the efficacy and thoroughness of the selected DOD PBL policy and guidance documents. This model was developed to help guide the reader in understanding what is required to implement PBL and whether it is or is not addressed in current DOD policies or guidance documents. It also provides a means to graphically depict the critical functions or requirements in PBL and physically identify shortfalls or gaps in these policies and guidance documents.

To build the model, a systems engineering process, called functional analysis, was used to decompose the overarching function, "Implement PBL." By means of functional decomposition, basic functions critical to implementing PBL were systematically identified. These critical functions (1.1 through 1.6 in the model) were generated logically identifying the absolute essential functions/needs for implementing PBL, as well as the author's personal knowledge, experience and understanding of PBL. In essence, PBL may not successfully or meaningfully be implemented without a majority, if not all, of these fundamental functions. These critical functions were further decomposed to identify lower-level functions which all support the associated higher-level function. Through this process of identifying key functions and sub-functions, a visual model emerged that could be used to assess whether a given policy or guidance document identifies or addresses all, some or none of these functions and sub-functions necessary for implementing PBL. Thus, the model serves as a means to identify where gaps, if any, exist in the current DOD policies and guidance on PBL.

It is important to note that this model does not intend to assess PBL in itself. It is more so a means of objectively identifying all functions and/or requirements needed to implement PBL. It focuses on what is needed to implement PBL, instead of how PBL should be implemented. Accordingly, in order to objectively assess policy and guidance,

the model is designed to identify what functions or sub-functions each policy or guidance document addresses or not.

It is also critical to understand that this thesis reviews both policy and guidance documents. Policy documents typically identify what needs to be complied with or executed. They rarely, if ever, provide instructions or guidance on how to perform or execute the directed policy. Guidance documents, on the other hand, supplement a targeted policy and provide information on how to comply with that related policy.

B. PURPOSE OF MODEL

The goal of creating this model is to identify and depict the functions or requirements needed to implement PBL. Further, it intends to help the reader readily identify shortfalls or gaps in the current policies and guidance on PBL that are reviewed in this thesis. Each of the policy or guidance documents reviewed will have an accompanying model snapshot that will graphically identify the specific functions or requirements that are not identified or addressed. The primary objective is to identify policy or guidance gaps in need of improvement to help better enable successful implementation of PBL across the DOD.

C. MODEL DESCRIPTION

This section explains each of the elements in the model, which represent the various functions and sub-functions needed to implement PBL. The PBL implementation model is shown in Figure 5.
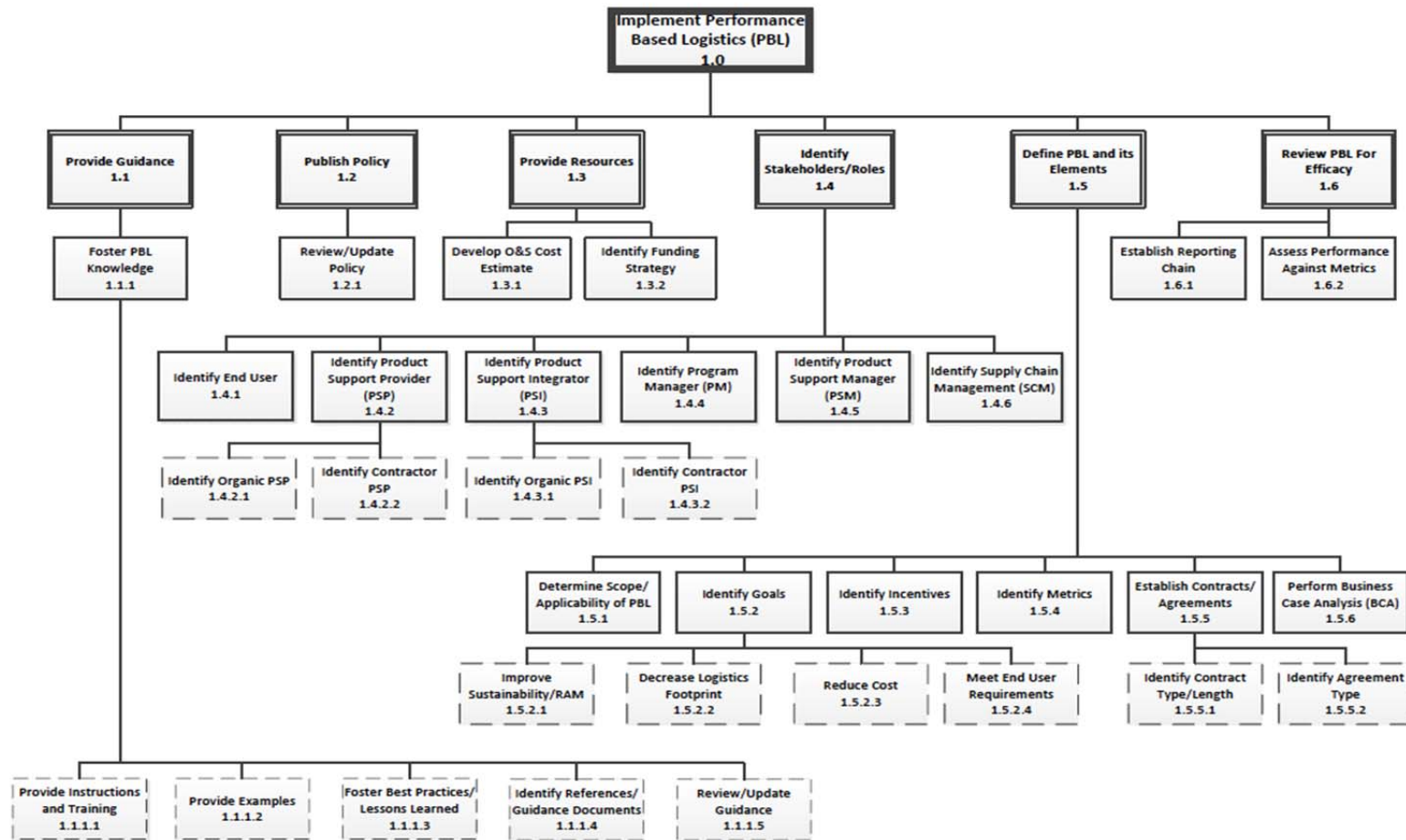
Figure 5.   PBL Implementation Model

1.—Implement PBL

With regard to PBL, *Better Buying Power 3.0* (2015) states, "When properly established and executed, Performance-Based Logistics (PBL) is an effective way to balance cost and performance regardless of whether industry or the Government is providing the logistics service. PBL also provides explicit productivity incentives and ensures the best value for the DOD, particularly for service contracts such as maintenance and support contracts" (USD (AT&L) 2015b, 8). This element is the starting point of the model, introducing the key action to be addressed, "Implement PBL."

1.1—Provide Guidance

In order to put into place any new process or way of doing business, leadership must provide guidance that assists the organization in implementing it. Guidance is not policy. Policy tells what must be done. Guidance seeks to explain how and why the new process is being implemented.

1.1.1—Foster PBL Knowledge

This element represents the general concept of informing and educating all stakeholders involved with product support about what PBL is and how to implement it. PBL represents a new way of obtaining product support that could be difficult for Program Managers and Product Support Managers to embrace initially because it is very different from the traditional transaction-based support strategies they may be more familiar with.

1.1.1.1—Provide Instructions and Training

An important aspect of providing guidance is to provide instructional publications, training materials and reference materials. All of these materials and documents are intended to supplement policy, law or regulations by providing lower level details to better communicate what the regulatory or statutory policies are directing. An effective guidebook or set of training materials can help an organization's personnel to better implement targeted policy or law as envisioned or intended by the policy makers. Another important aspect to remember about training materials or other instructional

documents is, they are written as references or guidance and typically are not directive in nature. They merely provide additional information to guide implementers of various ways or methods of achieving the desired effects of the policy.

1.1.1.2—Provide Examples

A powerful tool to help implementers of any given policy is to provide them with examples of how others in the field have successfully implemented them in the past. Simply describing a policy or methodology sometimes fails to adequately help practitioners, especially when a given policy does not exactly apply to their specific program or system. As an example, maintenance on a satellite deployed in outer space may not be properly addressed by maintenance policy that is written for terrestrial weapon systems. Remove and replace procedures for hardware components for aircraft or ships are not applicable to satellites that, once deployed into outer space, cannot be physically repaired or accessed by maintenance personnel. Therefore, maintenance policies for space systems may have to be written more toward software uploads and operations-centric procedures to activate or deactivate components, vice physical remove and repair procedures traditionally performed on systems that operate in Earth's environment. For PBL specifically, examples of how other systems implemented PBL could be very useful to help them better understand the effectiveness and applicability of it to their own programs.

1.1.1.3—Foster Best Practices/Lessons Learned

Best practices and lessons learned are general guidelines that have been learned through historical experiences or past endeavors that may have resulted in success or failure. These can be very powerful and helpful to implementers of PBL, steering practitioners toward beneficial activities or practices that can improve chances of success. Best practices can also be derived from past failures as well, informing of what not to implement. An example of a best practice for PBL is, longer duration contracts or agreements are encouraged as they allow enough time for support providers to recover any upfront capital investments they may have made toward optimizing their support

posture, thus potentially increasing availability or dependability of a system to the warfighter.

1.1.1.4—Identify References/Guidance Documents

This element is focused on whether references or guidance documents are identified in the policy or guidance document under review. If there are such reference materials or guidance documents available in support of any given policy or guidance, simply referencing them and pointing implementers to them could make the policy or guidance much easier to implement. Similar to the instructional or training materials mentioned in element 1.1.1.1, typically references or guidance documents are not directive in nature, but intend to supplement policy with additional information that may be helpful for implementation of said policy.

1.1.1.5—Review/Update Guidance

As with any form of change, especially with the evolution of something as complex as PBL, there will be changes along the way. Therefore, it is crucial that any policy or guidance document be updated regularly to stay abreast of any changes or improvements. In some cases, a document may explicitly state time intervals where the contents will be reviewed and updated for currency.

1.2—Publish Policy

This is simply communicating or publishing the actual policy that leadership wants to effect. This element, and its subordinate element, 1.2.1, only apply to the policy documents reviewed in this thesis.

1.2.1—Review/Update Policy

It is self-evident that policy must be clear and current. With respect to PBL, which is a constantly evolving concept, policy must also adapt to ensure that it is properly implemented as it is intended. It is also important that policy be consistent across all of the various statutory and regulatory documents that may touch on PBL. Some policy documents also inherently incorporate review/update schedules.

1.3—Provide Resources

In general, resources, such as funding and manpower, are essential for implementing PBL. More specifically, the activity of resource planning to ensure enough resources are identified or available to implement PBL is of concern with this element. This element does not include activities regarding how a program office will obtain funding (normally Operations and Maintenance appropriations) through the Program Objective Memorandum process to fund sustainment activities.

1.3.1—Develop Operating and Support (O&S) Cost Estimate

An important aspect of resource planning for PBL is to establish a cost estimate of support for a system. It can provide a starting point for negotiations on cost of support in candidate PBL contracts or arrangements with PSPs. An O&S cost estimate is particularly important for supporting a Business Case Analysis (BCA), which is addressed in another element in the model, 1.5.6, Perform Business Case Analysis (BCA). The BCA will help provide a decision on whether PBL is a feasible option for providing support to the system. The DOD's *O&S Cost Estimating Guide* (2014) says a BCA "is a structured approach to identify the cost, benefits, and risks of the alternatives. To ensure accurate results, the business case analysis depends on O&S cost data as well as requirements and supportability analysis results" (Secretary of Defense 2014, 3–13).

1.3.2—Identify Funding Strategy

As part of planning resources for PBL, program managers have to consider how they can provide funds. A major consideration is whether the support will come from an organic or contractor source. If it is from an organic source, for example, a government depot repair capability, then initial funding may have to go into a working capital fund. Otherwise, direct appropriation would be the method to fund a contract when using commercial support.

1.4—Identify Stakeholders/Roles

A critical part of the systems engineering process is to identify all stakeholders that may be impacted by a system. "Systems engineering is a systematic process that

includes reviews and decision points intended to provide visibility into the process and encourage stakeholder involvement. The systems engineering process includes stakeholders through all stages of the project, from initial needs definition through system verification and acceptance" (Ryen 2003, 4). For PBL implementation, and product support planning in general, the key stakeholders are identified in Figure 1 in Chapter I.

1.4.1—Identify End User

In the context of DOD weapon systems acquisition, the end user typically is the warfighter. It is critical for acquisition professionals to understand the needs and requirements of the warfighter in order to provide a successful and effective weapon system. Once the needs are understood and documented, maintenance planning can begin to capture all requirements and maintenance actions to keep the system available to the warfighter. PBL is intended to optimize system availability to the warfighter by buying system readiness, rather than buying traditional transaction-based maintenance processes/procedures and excessive sparing of replaceable items.

1.4.2—Identify Product Support Provider (PSP)

The PSP is the organization or entity that is assigned or contracted to provide system support. In other words, these organizations perform maintenance on the system, as well as other key maintenance-related activities, such as configuration management, supply chain management, and/or sustaining engineering.

1.4.2.1—Identify Organic PSP

The PSP may be an organic or government entity providing support for a system.

1.4.2.2—Identify Contractor PSP

The PSP may be a commercial or contractor entity providing support for a system.

1.4.3—Identify Product Support Integrator (PSI)

The *Product Support Manager Guidebook* (2011) states:

The Product Support Integrator (PSI) role is assigned within the scope, direction, and oversight of the Product Support Manager (PSM). (Note that the PSI is assigned at the discretion of the PSM; not all programs will

require a PSI). PSIs accomplish their product support role through us of one or more Product Support Providers (PSP). Product support integrators are responsible for the activities and output of one or more product support providers within a specific product support element or across product support elements. There may be a system-level PSI that manages subsystem level PSIs. A PSI may also perform the function of a product support provider. A PSI may be either a government or contractor entity. (ASD (L&MR) 2011b, 20)

1.4.3.1—Identify Organic PSI

The PSI may be an organic or government entity.

1.4.3.2—Identify Contractor PSI

The PSI may be a commercial or contractor entity.

1.4.4—Identify Program Manager (PM)

The PM is assigned Life Cycle Management responsibility and is accountable for the implementation, management, and oversight of all activities associated with development, production, sustainment, and disposal of a system across its life cycle. As part of this, the PM has the responsibility to develop an appropriate sustainment strategy to achieve effective and affordable operational readiness consistent with the Warfighter resources allocated to that objective. The PM's responsibilities for oversight and management of the product support function are typically delegated to a PSM who leads the development, implementation, and top-level integration and management of all sources of support to meet Warfighter sustainment and readiness requirements. (ASD (L&MR) 2011b, 17–18)

The assigned PM managing a weapon system acquisition, on behalf of the DOD, is inherently a government position.

1.4.5—Identify Product Support Manager (PSM)

The *Product Support Manager Guidebook* (2011) states the following:

DOD recognizes that the Program Manager (PM) has life cycle management responsibility. In 2009, Congress officially established the PSM as a key leadership position, distinct from the PM, who reports directly to the PM for ACAT 1 and 2 programs. The PM is charged with delivering Warfighter required capabilities while the PSM, working for the PM, is responsible for developing and implementing a comprehensive product support strategy and for adjusting performance requirements and

resource allocations across Product Support Integrators (PSIs) and Product Support Providers (PSPs) as needed to implement this strategy. Furthermore, the PSM's responsibility carries across the life cycle of the weapon system by requiring the revalidation of the business case prior to any change in support strategy or every five years, whichever occurs first. The PSM must be a properly qualified member of the Armed Forces or full-time employee of the Department of Defense. (ASD (L&MR) 2011b, 10)

1.4.6—Identify Supply Chain Management

Supply Chain Management, according to the *PSM Guidebook* (2014), includes

sustaining engineering, maintenance and maintenance planning, PHS&T, support equipment, and tech data. PSMs should be cognizant of their system's supply chain from a logically bounded end-to-end perspective. Supply chain management responsibility includes the distribution, asset visibility, and obsolescence mitigation for weapon system sustainment material. From a Warfighter's perspective, transportation and asset visibility have a substantial impact on high-level sustainment metrics and should be emphasized in the product support strategy. All the skilled labor, advanced technology, and performance of a modern weapon system mean little without the "right part, in the right place, at the right time." (ASD (L&MR) 2011b, 31–32)

The supply chain management function can be performed by either organic or commercial entities, depending on whichever option provides the best value to the government and meets the PSM's requirements.

1.5—Define PBL and its Elements

The concept and elements of PBL must be thoroughly understood before it can be implemented effectively.

1.5.1—Determine Scope/Applicability of PBL

Current policy directs, "Employ effective performance-based logistics (PBL) planning, development, implementation, and management in developing a system's product support arrangement" (USD (AT&L) 2015a, 113). However, the *PBL Comprehensive Guidance* memorandum, issued by ASD (L&MR) in 2013, suggests that maybe not all support arrangements may necessarily be appropriate for PBL to be employed. This element addresses the question of whether PBL is applicable to some or

all product support arrangements. Also, this element identifies the question of what scope or set of boundaries should be used for any given PBL arrangement. In other words, will PBL work for the entire system, or only for lower level sub-systems only, or for specific functions within the realm of product support? For example, a PSM may choose to apply PBL only to a sub-system that contains mature and well understood reliability and cost data. Or, the PSM may use PBL in an arrangement with another entity to provide only supply chain management functions, while keeping traditional contracts or arrangements for all other product support functions.

1.5.2—Identify Goals of PBL

In order to appropriately apply PBL methodologies and principles to a product support arrangement, one must understand what they intend to achieve by doing so. For example, is the intent of using PBL to contain product support costs, increase availability of the system to the warfighter, lock in a long-term arrangement with a support provider, reduce the overall logistics footprint, or a combination of these desired outcomes?

1.5.2.1 Improve Sustainability/RAM

One of the potential goals of employing PBL in a product support arrangement may be to improve the overall sustainability of the system. This could be achieved by seeking to improve the system or component reliability, availability and maintainability (RAM). For example, identification of a specific part or component that may be failing at a higher rate than desired could instigate the PSP to make engineering changes to improve its reliability, and thus, improve overall reliability of the associated system or subsystem. This could, in turn, reduce maintenance costs and increase availability of the system to the warfighter or end user. In addition, in a typical PBL approach, especially in a Firm Fixed Price contract, the PSP could benefit from such improvements by reducing their overall cost to maintain the system, leading to more profit for the PSP. This outcome is a win-win situation for both the warfighter and the PSP.

1.5.2.2 Decrease Logistics Footprint

"The Government/Contractor size or 'presence' of deployed logistics support required to deploy, sustain, and move a system. Measurable elements include inventory/equipment, personnel, facilities, transportation assets, and real estate" (ASD (L&MR) 2014, 136). The objective is to decrease overall logistics footprint and reduce support costs for the system.

1.5.2.3 Reduce Cost

One of the goals with PBL is to reduce support costs. As previously identified in Chapter I in Figure 3, we saw that O&S costs make up a large amount of the overall life cycle cost of any given weapon system. Through any variety of the PBL goals mentioned under 1.5.2, the potential reduction of cost to support a given system is highly desirable, especially in an environment where the DOD is trying to maintain a high posture of national defense with shrinking budgets.

1.5.2.4 Meet End User Requirements

The overarching goal for any weapon system is to meet the needs of the end user, or warfighter. The ultimate challenge is to do so in a cost efficient and highly effective manner to help the DOD meet its national defense strategy. Meeting warfighter requirements is made difficult by a number of factors, which include rapid changes in technology, the threats we face, geopolitical situations, and pressures on budgets.

1.5.3 Identify Incentives

An important tenet in PBL is the use of incentives to elicit a favorable outcome for both the warfighter and the product support organizations.

> An incentive is anything that encourages or motivates somebody to do something. With respect to PBL arrangements, it is any term or condition that encourages the desired product support integrator and/or provider behavior to deliver the relevant Warfighter outcome (for aspects of performance that are within their control). The incentive may be related to contract type, contract length, or incentive fees (or penalties). A FFP contract provides the strongest incentive for the provider to control costs. However, FFP contracts do not share these savings with the Government, and without additional mechanisms (e.g., Contract Data Requirements

Lists (CDRLs)), they do not provide the information needed by the Government to understand actual costs for negotiations on future PBL contracts. Another powerful incentive is the ability to receive extensions to the duration of the contract (award term) with good performance. This provides stability to the provider's order book and adds shareholder value. Incentives that focus on profit may not be applicable for public facilities, but increased percentage of available workload, promotions, bonuses, and spot awards are all possible incentives along with the desire to positively impact Warfighter outcomes. Whatever form the incentive takes, it should be sufficient to ensure the desired behavior and outcome over a range of conditions. (ASD (L&MR) 2014, 114)

1.5.4 Identify Metrics

Metrics are another important tenet in implementing PBL effectively.

Performance metrics are vital to the success of a PBL arrangement. The Government needs insight into program performance to determine compliance with performance requirements and level of mission success. For example, one important area to gather measurement data is related supply chain performance, as these are associated with key performance indicators such as materiel availability and operations and support costs. The PSM is responsible for the performance of the product support solution and will use Warfighter relevant metrics to monitor its performance. Metrics assigned to the PSI or PSP reflect the responsibilities assigned to them. They should not reflect outcomes that are beyond the PSI/PSP ability to influence and are not part of the arrangement. The selected metrics should be measurable and manageable and map back to the higher-level program metrics. For example, a PSP may be responsible for the availability of their product and the associated metric may be supply material availability or logistics response time. Too many metrics make it difficult to manage and may also work at cross purposes to each other. Also, data must be available for the metric. There have been occasions where metrics were required as part of an arrangement without the ability to collect the data to determine performance against the metric. (ASD (L&MR) 2014, 114)

Some common metrics applied in PBL are as follows. Keep in mind, this is not an exhaustive list of all possible metrics that can be used in a PBL arrangement, but is merely included here to familiarize the reader with some of the most common ones.

- Operational Availability (Ao)—The percentage of time that a system or group of systems within a unit are operationally capable of performing an assigned mission and can be expressed as uptime/(uptime+downtime) (ASD (L&MR) 2014, 133).

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- Materiel Availability (Am)—The percentage of the total inventory of a system operationally capable (ready for tasking) of performing an assigned mission at a given time, based on materiel condition (ASD (L&MR) 2014, 134).

- Mean Time Between Failure (MTBF)—For a particular interval, the total functional life of a population of an item divided by the total number of failures (requiring corrective maintenance actions) within the population (ASD (L&MR) 2014, 133).

- Mean Time To repair (MTTR)—The total elapsed time (clock hours) for corrective maintenance divided by the total number of corrective maintenance actions during a given period (ASD (L&MR) 2014, 136).

- Logistics Response Time (LRT)—The amount of time (measured in mean days) that elapses from the date a customer establishes a requisition to the date the customer receives the material that was ordered (ASD (L&MR) 2014, 136).

1.5.5 Establish Contracts/Agreements

To obtain performance based product support, a PSM must document the arrangements necessary to meet the needs of the warfighter. PBL arrangements can be documented in the form of a contract or agreement.

1.5.5.1 Identify Contract Type/Length

For obtaining performance based product support, there are many different types of contracts from which a program manager must decide, with the assistance of the program's Procurement Contracting Officer (PCO). As one of the key tenets of PBL, a "Firm Fixed Price (FFP) contract is generally the preferred contract type (however, Fixed Price Incentive Fee (FPIF) and Cost Plus Incentive Fee (CPIF) may be effective) (ASD (L&MR) 2014, 114).

> When coupled with a requirement to deliver a Warfighter relevant outcome versus delivery of a part or service, a FFP contract converts a traditional revenue center in a transactional business model to a cost center under PBL. The provider is required to deliver a specific Warfighter relevant outcome for a set price. It transfers the financial risk from the Government to the provider. In this fashion, it acts as a powerful incentive for PSIs and PSPs to improve the reliability of their product and the efficiency of their processes in order to reduce their cost to deliver the

desired outcome. The lower their cost to perform, the greater the provider profit associated with the fixed price. In order to transfer risk in this fashion to the provider, the failure modes and rates need to be stable enough to reasonably forecast demand. Otherwise, the provider will price in the difficulty with assessing the risk ultimately becoming an unaffordable option.

As the uncertainty and associated risk increases, a more appropriate contract type would be a FPIF or a CPIF arrangement. FPIF contracts provide a mechanism for the provider to reduce costs while sharing those cost savings with the Government. Without sharing, there can be instances when the Government does not fully understand the actual costs or the cost-saving opportunities available to the provider. The further the contract type moves from FFP and FPIF toward cost plus, the less incentive there is for the provider to improve the product and lean out their processes (without reasonable assurance of a follow-on arrangement). Conversely, a cost-plus fixed-fee contract is generally not appropriate for PBL arrangements. (ASD (L&MR) 2014, 114–115)

The length of a PBL contract is also considered a key tenet in obtaining PBL support. The *PBL Guidebook* (2014) states, "Provide sufficient contract length for the product support provider to recoup investments on improved product (e.g., MTBF) and sustainment processes (e.g., manufacturing capabilities)" (ASD (L&MR) 2014, 115). A typical PBL contract could be five years or more in length. An additional benefit to longer contracts is less frequent turnover of service providers, which could provide more stability and continuity in product support, while fostering longer relationships and more trust between PSMs and PSPs. Lastly, with less frequent turnover of contracts, the government will expend less time and resources toward the source selection process of identifying a prevailing contractor each time a contract is up for competition.

1.5.5.2 Identify Agreement Type

A performance-based agreement is essential for a PSM or PSI to document performance targets or expectations and identify associated performance incentives for a PSP to execute toward. A contract can be a type of performance-based agreement when a contractor is fulfilling the PSP role. However, if the PSP is an organic government organization, a Memorandum of Agreement (MOA), Memorandum of Understanding

(MOU), or Service-Level Agreement (SLA) may be more appropriate to document the relationship and performance expectations.

1.5.6 Perform Business Case Analysis (BCA)

A BCA is required by Public Law 111–84, Sec 805, dated 28 October 2009, and requires a PSM to "conduct appropriate cost analyses to validate the product support strategy, including cost-benefit analyses as outlined in Office of Management and Budget Circular A-94." A BCA is a tool for PSMs to help identify whether a PBL arrangement is a value-added approach to buying product support.

D.   SUMMARY

The definitions and descriptions of each of the elements above are intended to provide an understanding of the model and its components. With a better understanding of the elements of the model and how they describe the basic necessities for implementation of PBL, one can see how informational gaps in policy and guidance can be identified by assessing whether a given document addresses some, all or none of the elements. In the next chapter, a gap analysis is performed for the selected PBL-related policy and guidance documents, based on the definitions and descriptions of the model elements in this chapter.

IV. REVIEW OF POLICY/GUIDANCE AND RECOMMENDATIONS

A. APPROACH FOR GAP ANALYSIS

To conduct a gap analysis of the current DOD guidance and documentation regarding the implementation of PBL, this thesis first proposed a PBL implementation model in Chapter III. This model was used to assess the completeness of each selected current policy and guidance document to identify any informational gaps that may exist. To identify these gaps, each of the selected documents were critically reviewed and analyzed to find where they either satisfactorily cover or fail to address the criteria for each applicable element in the model. The elements that are not adequately covered are identified and addressed in this chapter. For each document, these gaps are graphically depicted in the PBL implementation model to clearly show the elements where the deficiencies exist. Finally, recommendations are provided for closing each of the identified gaps.

The selected review documents are organized into two tiers by type, namely Policies and Guidance. The two groups of documents, depending on their aim and purpose, have elements within the model that are typically associated with each. The Policy documents primarily address the high level elements in the model as they are aimed at describing what must be done, and not so much on how they must be done. The Guidance documents are an assortment of guidebooks that provide a lower level of detail on how to implement PBL, among other acquisition or logistics concerns, and were written chiefly to assist PMs, PSMs and program staffs, as opposed to merely directing policy. The documents reviewed and their associated tier levels are as follows:

Policy Documents:

- *DODD 5000.01* (May 12, 2003)
- *DODI 5000.02* (January 7, 2015)
- USD (AT&L) Memorandum "*Better Buying Power 3.0*" (April 9, 2015)
- ASD (L&MR) *PBL Comprehensive Guidance* (November 22, 2013)

Guidance Documents:

- ASD (L&MR) *Product Support Manager Guidebook* (April 2011)
- ASD (L&MR) *PBL Guidebook* (May 27, 2014)

B.   HOW THE PBL IMPLEMENTATION MODEL IS USED

In Figure 6, the model elements within the boundary of the red dashed lines primarily pertain to the Policy level of documents. In Figure 7, the model elements within the boundary of the red dashed lines identify the domain of the Guidance documents. Although the depictions of the model in Figures 6 and 7 suggest that Policy and Guidance documents each have their own definitive boundaries, it was anticipated that there would be some overlap between Policy and Guidance documents. As an example, this is especially true for ASD L&MR's *PBL Comprehensive Guidance* (2013) memorandum, where a mixture of directive policy and reference-like guidance information was put forth together in one document. A detailed explanation of the document is provided later in this chapter. The gray boxes indicate elements that are not applicable for the type of document being reviewed. For example, for policy documents covered by Figure 6, the element "Provide Resources" and its subordinate elements are not applicable because it is assumed that resources, such as funding and manpower, will be provided by the implementing organization and its command structure. For guidance documents covered by Figure 7, the element "Publish Policy" and its subordinate element do not apply because that is not the purpose or authority of guidance documents.
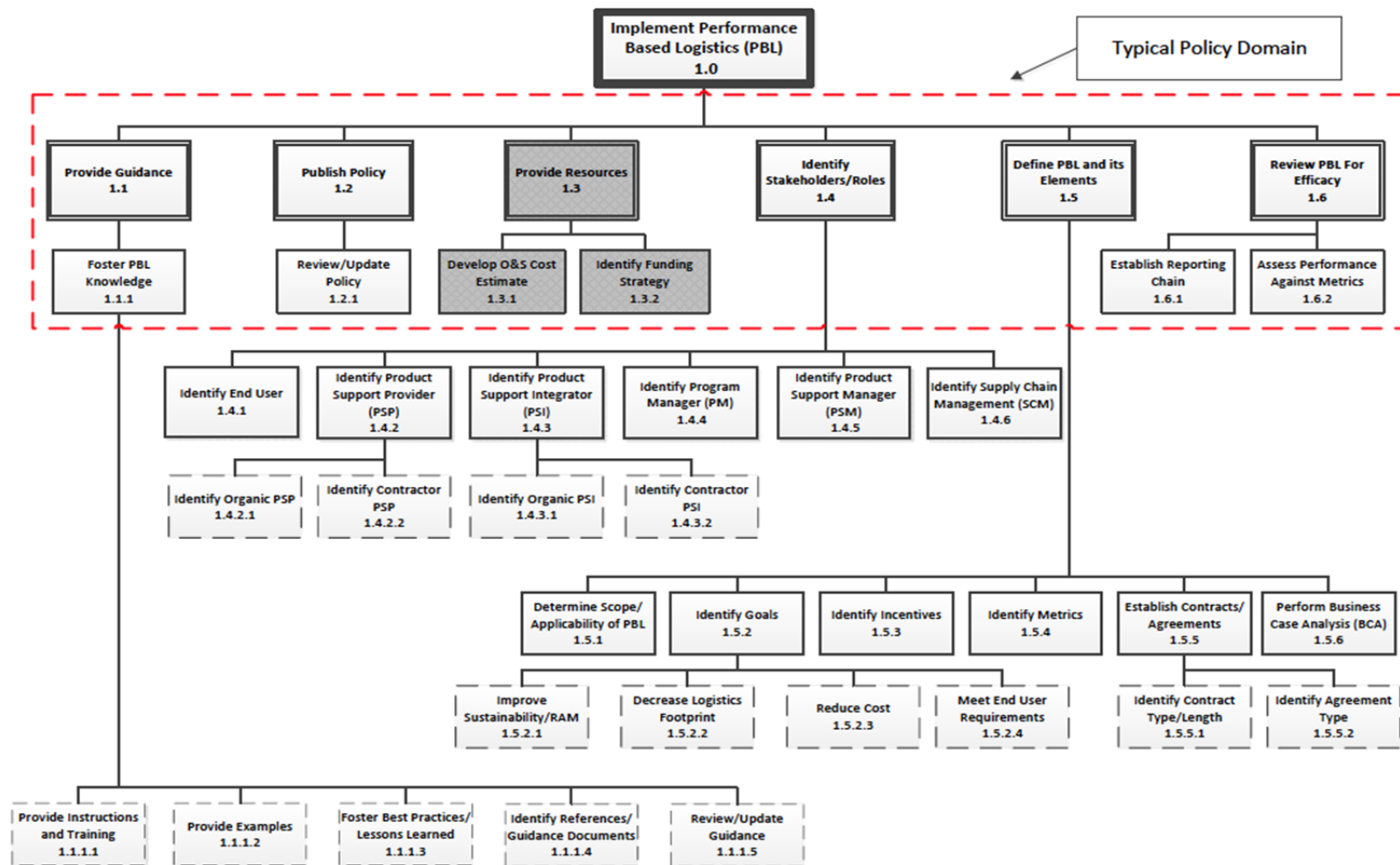
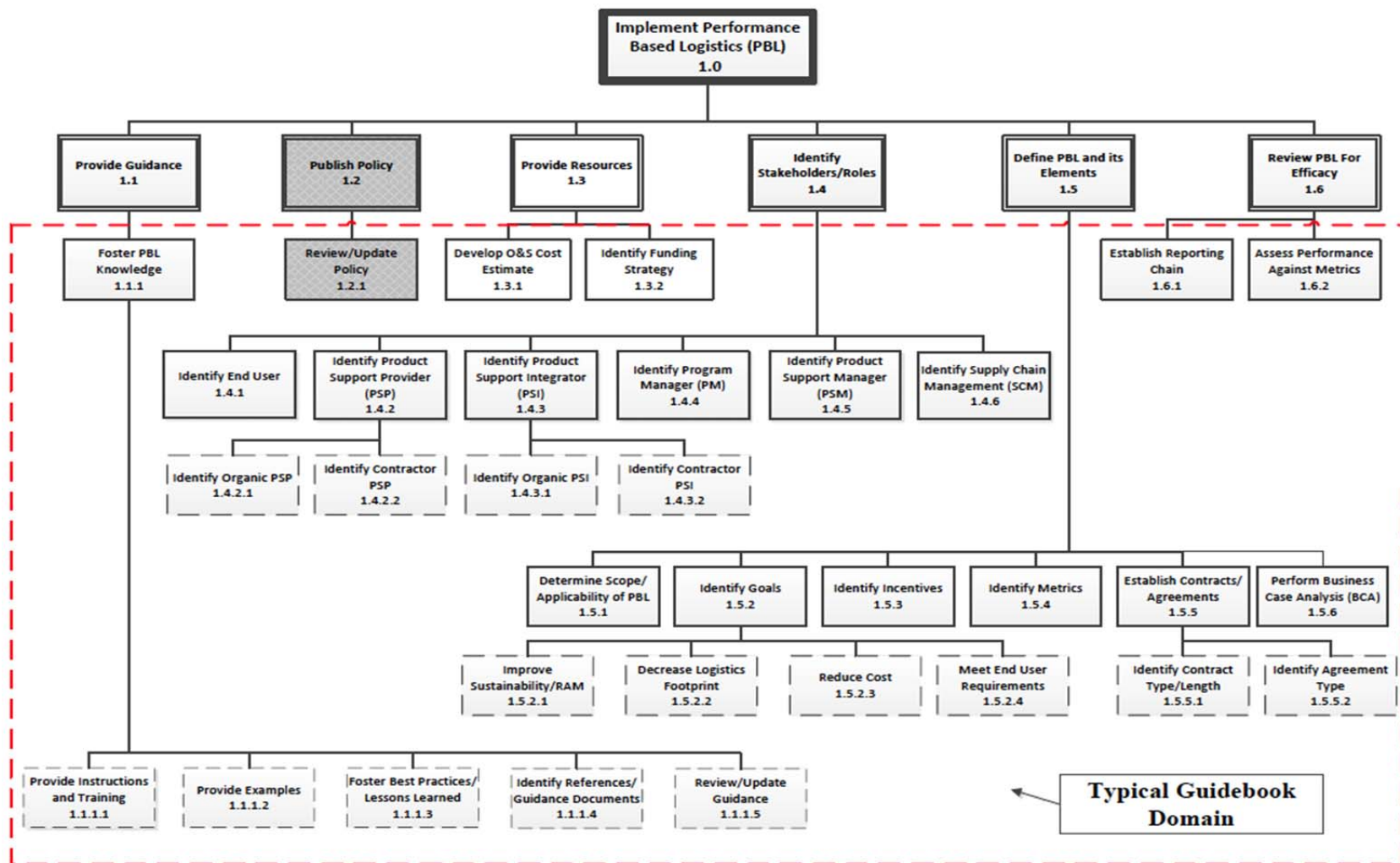Figure 6.　Policy Domain in PBL Implementation Model

Figure 7.   Guidebook Domain in PBL Implementation Model

For each of the documents reviewed and analyzed in this thesis, a graphic model is included to show where the informational gaps were found. The elements that were found to be adequately covered to facilitate PBL implementation were colored green. The deficient elements were colored red. In some documents, certain elements were discussed, but not in a manner that was determined to be helpful for successful implementation of PBL. These elements were colored yellow.

As previously stated in Chapter II, all PBL policy and guidance reviewed are at the DOD level and not at the component Services level because the amount of DOD level documentation was found to be abundant and pertinent for the scope of this thesis.

C.   GAPS IN POLICY LEVEL DOCUMENTATION

The policy documents reviewed in this section establish the regulatory foundation for implementing PBL. They generally aim to establish policy to direct PMs and PSMs, and their associated staffs, to plan and execute efficient and effective product support strategies to meet warfighter readiness needs and reduce life cycle costs. As mentioned previously and depicted in Figure 6, PBL-related policy documents generally address the higher level elements in the model (elements 1.1 through 1.6). Therefore, the identified gaps and associated recommendations in Section C will only address these higher level elements.

1.   *DODD 5000.01*

DODD 5000.01 The Defense Acquisition System, certified current as of November 20, 2007, is the chief document establishing policy for all DOD acquisition programs (USD (AT&L), 2007). It is important to note that per *DODI 5025.01* (2014), this DODD is restricted to no more than ten pages in length and should contain no procedures (DOD 2014). However, because of the high level of this document, it is important that it not only establish policy, but also provide a succinct but clear definition of any concept it is mandating, especially in the case of PBL. It fails to provide a clear definition of PBL. This is critical in laying the foundation for proper implementation of the PBL concept as

it flows down the requirement to all other supporting or subordinate policy documents, such as *DODI 5000.02* (2015).

DODD 5000.01 (2007) does contain language addressing PBL. It states the following:

> PMs shall develop and implement performance-based logistics strategies that optimize total system availability while minimizing cost and logistics footprint. Trade-off decisions involving cost, useful service, and effectiveness shall consider corrosion prevention and mitigation. Sustainment strategies shall include the best use of public and private sector capabilities through government/industry partnering initiatives, in accordance with statutory requirements. (USD (AT&L) 2007, 7)

This document is not a useful reference to facilitate implementation of PBL. This is not unexpected, as policy documents, especially those limited in scope by other regulations, typically do not contain lower level details. These lower level details are typically found in guidance documents and are also would be helpful for implementers.

This document is deficient in the following top-level elements (the essential elements that are important for a policy level document for PBL):

1.1 Provide Guidance

1.4 Identify Stakeholders/Roles

1.5 Define PBL and its Elements

1.6 Review PBL for Efficacy

The deficient elements in the model for this document are clearly seen (shown in red) in Figure 8. The model also identifies some lower level elements that are addressed by this document to illustrate areas of overlap into domains where the lower level guidance of guidebooks provide similar information.
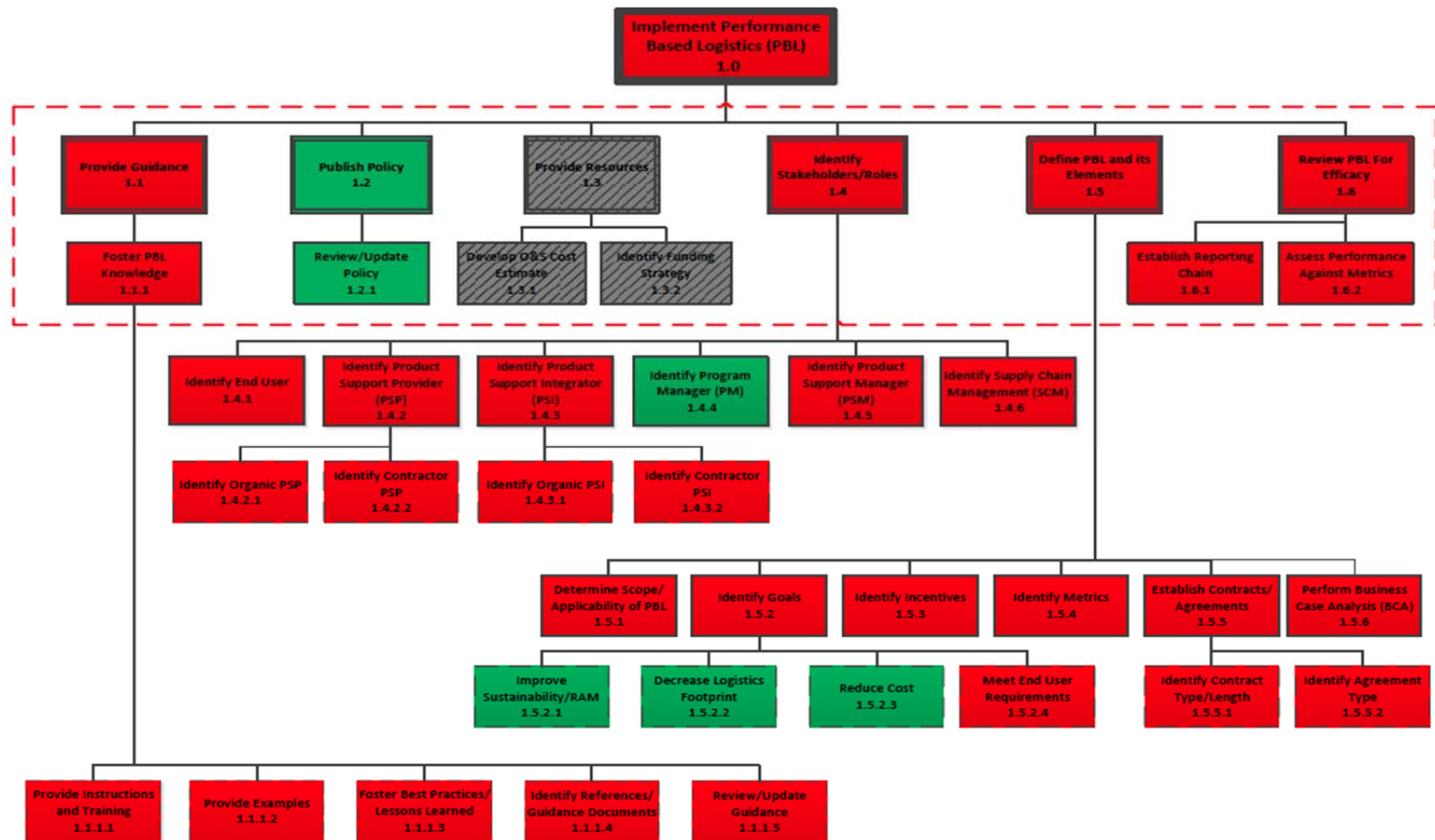
Figure 8. Model Analysis Results for DODD 5000.01

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Gaps and Recommendations

1.1 Provide Guidance: The primary gap identified here is this document does not provide any specific guidance that would help a PM or logistician implement PBL effectively. Although it can be argued that this DODD, in accordance with *DODI 5025.01* (2014), is not required to give any procedures or guidance on *how* to implement PBL, it should refer or point to additional sources of information to help PBL practitioners. It is also conceded that at the time of this DODD's writing in 2007, there were few, if not any, DOD level guidebooks published that comprehensively addressed PBL. All of the other DOD guidebooks reviewed in this thesis were published well after 2007 and since have been updated with more details concerning PBL and how to implement it.

Recommendation: Although more detailed DOD level guidance came out after this DODD's publishing, it is recommended that a future revision of this document include references to the new guidebooks that fill this gap. For example, it should provide references to the new *PBL Guidebook* (2014), the *PSM Guidebook* (2011), as well as the *Defense Acquisition Guidebook* (2013). This referencing of other documents may be an appropriate solution considering the inherent informational limitation of a ten page or less DODD level document.

1.4 Identify Stakeholders/Roles: The date of publication for *DODD 5000.01* (2007) precedes the establishing of the Product Support Manager (PSM), which came into being in 2009 (ASD (L&MR) 2013).

Recommendation: Introduce the PSM and its role in a future revision of *DODD 5000.01* (2007).

1.5 Define PBL and its Elements: This document fails to define PBL adequately. It only addresses a sub-element of the element, Define PBL, in the model. This sub-element, Identify Goals, has three lower level elements a) Increase Sustainability/RAM, b) Decrease Logistics Footprint, and c) Reduce Cost. These are addressed in *DODD 5000.01* (2007) in the statement, "PMs shall develop and implement performance-based logistics strategies that optimize total system availability while minimizing cost and

logistics footprint" (USD (AT&L) 2007, 7). However, it does not identify the main principles of PBL as stated in Chapter I of this thesis.

Recommendation: In order to fill this gap, the next revision of this document should include a more comprehensive definition of PBL. This thesis recommends An easy solution is to incorporate the definition found in the *PBL Guidebook* (2014), published by ASD (L&MR) in May 2014, which says, "PBL is synonymous with performance-based life cycle product support, where outcomes are acquired through performance-based arrangements that deliver Warfighter requirements and incentivize product support providers to reduce costs through innovation. These arrangements are contracts with industry or intra-governmental agreements" (ASD (L&MR) 2014, 8). In addition, the definition should be modified by adding a) delivering warfighter requirements also means optimizing weapon system availability via well-defined metrics and b) incentivizing product support providers reduces costs and logistics footprint through innovation. Finally, it is recommended that it also mention performing a business case analysis to determine how best to apply PBL.

1.6 Review PBL for Efficacy: There are no specific means identified in this document to report status of a program's PBL arrangement to the Milestone Decision Authority (MDA). In the document, it states:

> E1.1.20. Program Information. Complete and current program information is essential to the acquisition process. Consistent with the tables of required regulatory and statutory information appearing in reference (b), decision authorities shall require PMs and other participants in the defense acquisition process to present only the minimum information necessary to establish the program baseline, describe program plans, understand program status, and make informed decisions. The MDA shall "tailor-in" program information. IPTs shall facilitate the management and exchange of program information. (USD (AT&L) 2007, 7)

This is problematic in two ways. First, this document calls out "reference (b)," which is the outdated May 12, 2003, *DODI 5000.2*. It was superseded by the newer *DODI 5000.02*, dated November 25, 2013. Second, when a PM presents their program to the MDA, the document merely requires them to provide "only the minimum information necessary to establish the program baseline, describe program plans, understand program

status, and make informed decisions" (USD (AT&L) 2007, 8). It is unclear whether reporting on PBL use would be included or meets the threshold of inclusion when addressing all critical decision points in a complex acquisition.

Recommendation: In the next revision of *DODD 5000.01* (2007), the references list should be updated to point to the more current *DODI 5000.02* (2015) document. The newer *DODI 5000.02* (2015) includes several means of identifying whether PBL is used or not to decision makers. One of the means is, "The DOD Components will conduct independent logistics assessments for all weapon system MDAPs prior to Milestones B and C and the Full-Rate Production Decision to assess the adequacy of the product support strategy, and to identify features that are likely to drive future operating and support costs, changes to system design that could reduce costs, and effective strategies for managing such costs" (USD (AT&L) 2013, 117). Also, all Milestone Decision events include a review of the program's Life Cycle Sustainment Plan (LCSP), which captures the product support strategy for a program. Therefore, by updating the reference, the Review For Efficacy element in the model would be satisfied and effective reporting of PBL as the product support strategy will be communicated to senior decision makers.

2.   *DODI 5000.02*

DODI 5000.02 Operation Of The Defense Acquisition System, dated January 7, 2015, identifies the overarching management principles and mandatory policies governing the Defense Acquisition System. Enclosure 6 is the section that pertains to Life Cycle Sustainment. With regard to PBL, this document states that the PM, with the support of the PSM, will, "Employ effective performance-based logistics (PBL) planning, development, implementation, and management in developing a system's product support arrangements. PBL is performance-based product support, where outcomes are acquired through performance-based arrangements that deliver warfighter requirements and incentivize product support providers to reduce costs through innovation" (USD (AT&L) 2015a, 113). This document also directs that they continually evaluate and revise the product support approach, while also monitoring for product support performance so as not to negatively impact system availability and cost (USD (AT&L) 2015a). *DODI*

5000.02 (2015) provides more guidance and information about product support than *DODD 5000.01* (2007). However, it too, fails to provide adequate guidance specifically to implement PBL. The document provides a definition of PBL and also identifies that PSIs and PSPs can be organic, commercial, or a combination of both. The document also identifies specific support metrics, although they are not explicitly mentioned as appropriate PBL-related metrics. This document does serve the purpose of publishing policy stating the PM and PSM will employ PBL.

This document is not a useful reference to facilitate implementation of PBL. This is not unexpected, as policy documents typically do not contain the lower level elements in the model, which are typically found in supplemental guidance documents.

DODI 5000.02 (2015) is deficient in the following top-level elements (the essential elements that are important for a policy level document for PBL):

1.1 Provide Guidance

1.4 Identify Stakeholders/Roles

1.5 Define PBL and its Elements

1.6 Review PBL for Efficacy

The deficient elements in the model for this document are shown in red in Figure 9. The model also identifies some lower level elements that are addressed by this document to illustrate areas of overlap into domains where the lower level guidance of guidebooks provide similar information.
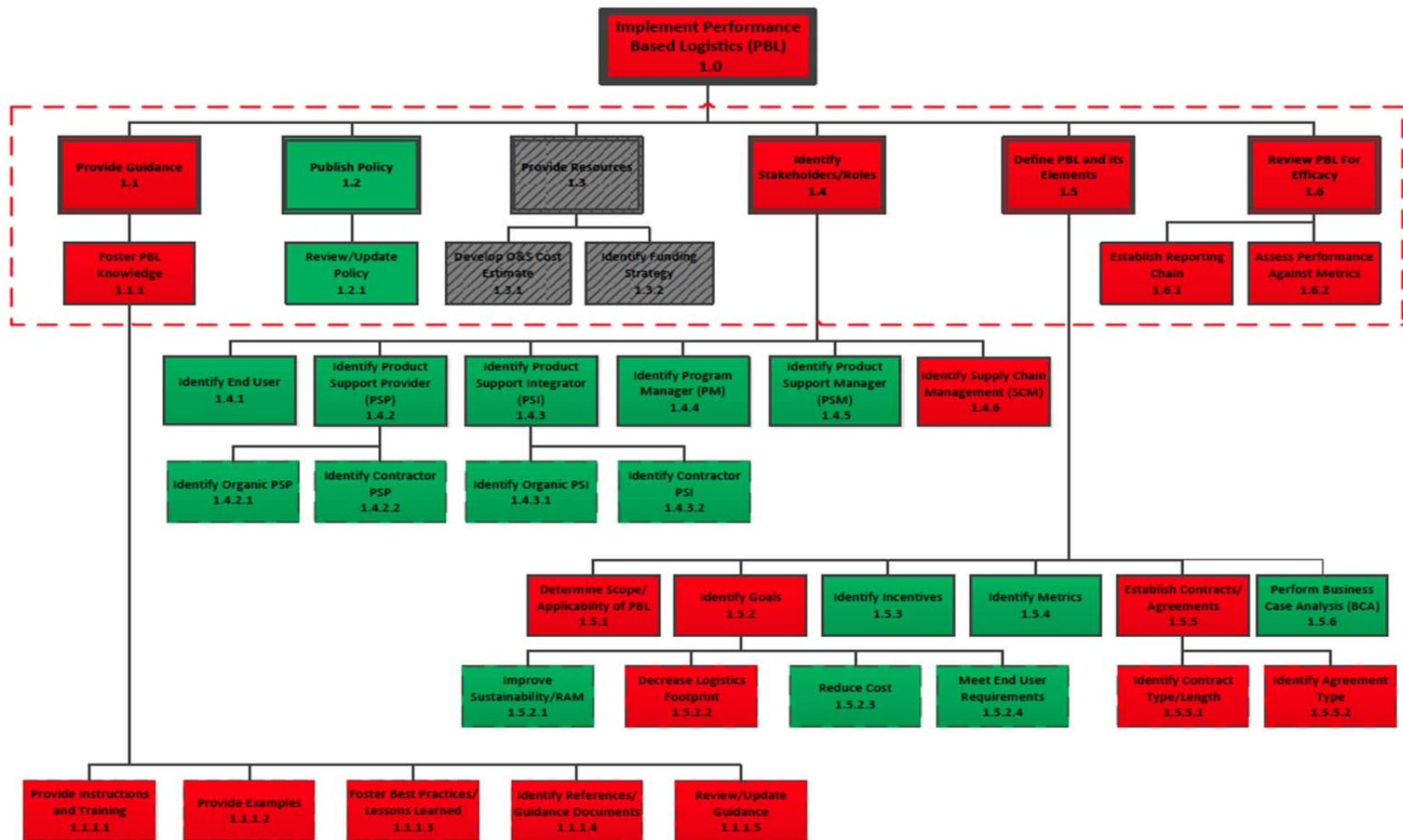
Figure 9.   Model Analysis Results for DODI 5000.02

Gaps and Recommendations

1.1 Provide Guidance: *DODI 5000.02* (2015) failed to provide adequate guidance necessary to support implementation of PBL. It failed to reference available guidance documents that could provide additional information to help implementers of PBL. For example, it should provide references to the new *PBL Guidebook* (2014), the *PSM Guidebook* (2011), as well as the *Defense Acquisition Guidebook* (2013). Interestingly, the reference list did include the *O&S Cost Estimating Guide* (2014), which may seem to indicate that the DOD has a greater focus on the cost of their acquisition programs. *DODI 5000.02* (2015) also failed to provide any examples of PBL or lessons learned to facilitate better employment of PBL.

Recommendation: To rectify this shortfall, simply update the references list in *DODI 5000.02* (2015) to include the *PBL Guidebook* (2014), the *PSM Guidebook* (2011), and the *Defense Acquisition Guidebook* (2013). This would provide PBL implementers with a reference for additional information that may help them in employing PBL.

1.4 Identify Stakeholders/Roles: This document makes no mention of the Supply Chain Management (SCM) function and its importance to product support, especially in a PBL arrangement. Employing an efficient SCM function, regardless of whether it is provided by an organic or commercial organization, is essential to meeting the objective of PBL and meeting Warfighter readiness needs while potentially reducing life cycle costs.

Recommendation: Include language in the document emphasizing the importance of SCM as a function in a PBL arrangement.

1.5 Define PBL and its Elements: There are several issues within this high level element that pose an issue for implementing PBL. First, the document does not mention one of the goals of PBL, reducing the logistics footprint. This goal is aimed at reducing assets and resources needed to sustain the system. By doing so, a PSP can reduce life cycle costs and reduce the logistical burden on deploying a system (ASD (L&MR) 2011). Also, the document does not address the applicability, or not, of PBL to a system's product support needs. This is primarily because this policy document mandates the use

of PBL, regardless of feasibility or applicability. This is an issue that is further addressed in Chapter V. Lastly, this document does not address agreement types, contract types or appropriate contract length for PBL.

Recommendation: Include language about reducing logistics footprint as a goal of employing PBL. Addressing feasibility or applicability of PBL will be problematic unless the policy is changed to accommodate this. Again, this is addressed as a major finding in Chapter V. Finally, this document should, at a minimum, mention performance based agreements as the vehicle to establish performance requirements and associated incentives resulting from achieved support performance. Contract length is important as well and should be included to emphasize that longer term arrangements encourage PSPs to make upfront investments to increase system availability, while allowing the PSP time to recoup those costs over the life of a PBL arrangement.

1.6 Review PBL for Efficacy: This document failed to provide a means for PMs and PSMs to specifically review PBLs for efficacy and report status to senior leadership, so as to provide awareness on challenges and successes of PBL arrangements in the field.

Recommendation: Include language directing PBL reporting and specifically identify PBL as a part of a data package to be reported to senior leadership. *DODI 5000.02* (2015) does direct PMs to perform Independent Logistics Assessments (ILA), whereby, they would have a channel for reporting product support status to leadership. Simply adding language to include PBL reporting as part of the ILA process would direct PMs to provide details on how their program is employing PBL. This would also further instill the notion that PBL is now a part of our DOD culture with appropriate emphasis.

3.   USD (AT&L) Memorandum *"Better Buying Power 3.0"*

Better Buying Power (BBP) 3.0 (2015) is the third in a series of implementation directives and attachments provided by the Under Secretary of Defense (AT&L) to increase the productivity, efficiency, and effectiveness of the DOD's acquisition, technology and logistics efforts. PBL is specifically addressed in *BBP 2.0* (2012) and *BBP 3.0* (2015) and has resulted in ASD (L&MR) creating in 2013 the *PBL Comprehensive Guidance* document, as well as the *PBL Guidebook* (2014). The BBP

policy documents provide an indication of how serious the DOD is about implementing PBL.

The *BBP 2.0* (2012) and *BBP 3.0* (2015) documents provide a fair amount of guidance on PBL. As part of *BBP 2.0* (2012), the Defense Acquisition University (DAU) stood up two classroom courses and ten distance learning and online courses for PBL. DAU also established a dedicated team of PBL experts to assist and train PBL implementers in each of the DOD components with the mission of helping them develop and manage PBL arrangements.

A key aspect of *BBP 3.0* (2015) is that it directs several specific actions to ensure the effective use of PBL:

- "ASD (L&MR) will continue to work with the Services and other DOD Components to develop common ways to measure PBL effectiveness, including benefits and savings, and to use those measures to track results. Results of this effort will be reported to USD (AT&L) and the Business Senior Integration Group (BSIG) on a quarterly basis" (USD (AT&L) 2015b, 9).

- "As under BBP 2.0, and using these effectiveness measures as they are developed and implemented, the Component Acquisition Executives (CAEs) will provide updates by July 2015 to the BSIG on the implementation of PBL arrangements, including determining the accessible market by Component, the ongoing use of PBL arrangements, plans for additional PBL arrangements, and progress toward those plans. Additional updates will be provided on a quarterly basis thereafter" (USD (AT&L) 2015b, 9).

- "ASD (L&MR) will assess the business case analyses for selected current and ongoing PBL arrangements and will provide the results of those assessments to USD (AT&L) as they become available. In addition, ASD (L&MR) will update the PBL Guidebook by October 2015, incorporating lessons learned and best practices from industry and across DOD. As part of that update, ASD

(L&MR), with DPAP and the DOD Components, will assess improvements for developing, reviewing, approving, and contracting for PBL arrangements" (USD (AT&L) 2015b, 9).

- "DAU will update PBL learning assets to reflect the above assessments and lessons learned, including case studies, by February 2016, following the update of the Guidebook" (USD (AT&L) 2015b, 9).

BBP 3.0 (2015) is deficient in the following top-level elements (the essential elements that are important for a policy level document for PBL):

1.4 Identify Stakeholders/Roles

1.5 Define PBL and its Elements

The deficient elements in the model for this document are shown in red in Figure 10. The model also identifies some lower level elements that are addressed by this document to illustrate areas of overlap into domains where the lower level guidance of guidebooks provide similar information.
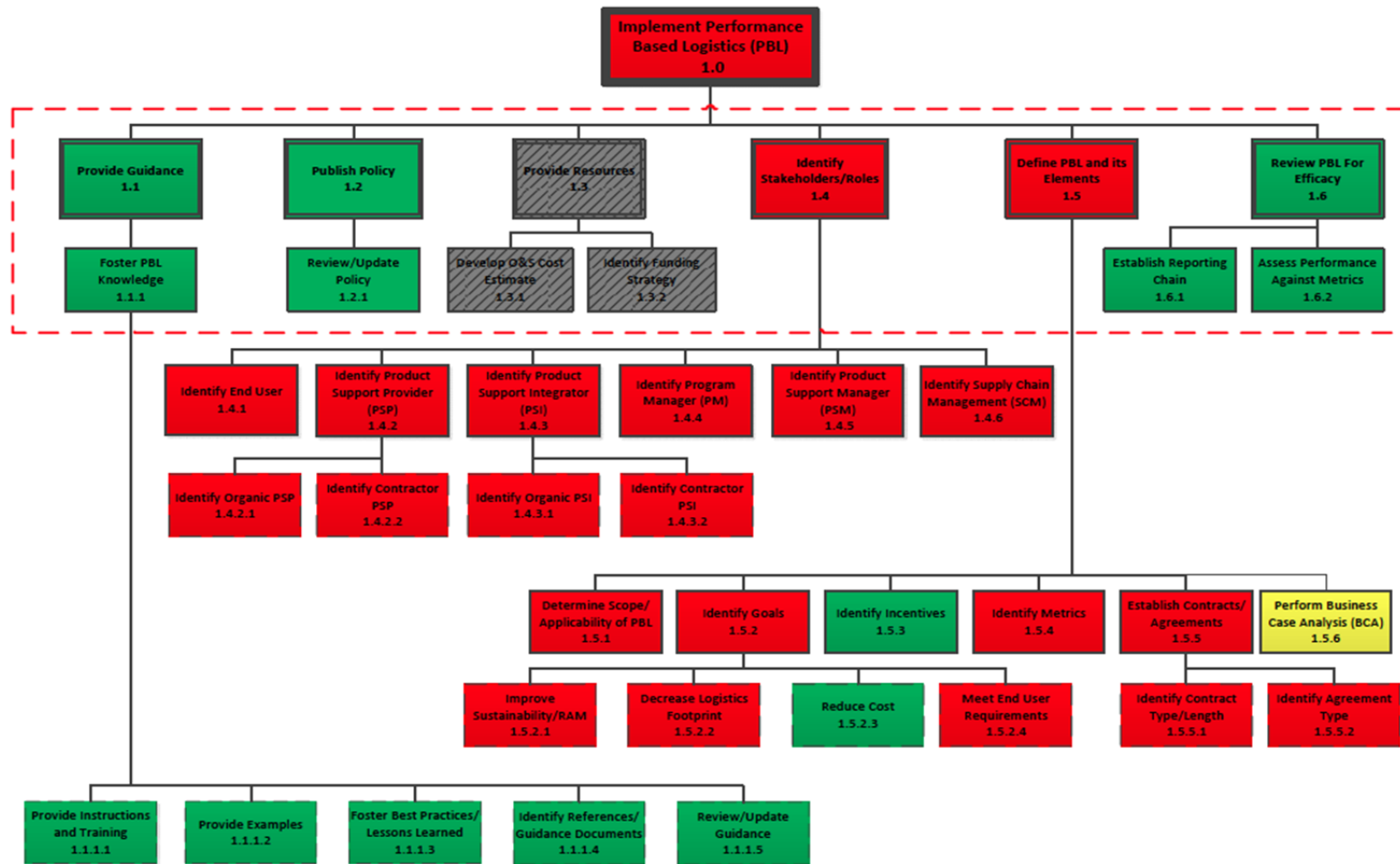
Figure 10.   Model Analysis Results for Better Buying Power 3.0

Gaps and Recommendations

1.4 Identify Stakeholders/Roles: *BBP 3.0* (2015) fails to identify the most critical stakeholders and implementers of PBL, namely the PM and PSM. Both the PM and PSM are clearly identified in *DODI 5000.02* (2015) as key responsible parties in ensuring PBL is implemented at the program level. Without identifying at least these two key stakeholders, a service or component level acquisition leader may not understand who in his/her organization is responsible for PBL implementation. Also, the text specifically covering PBL, and ensuring its effective use, never links the benefits of effective PBL to increasing availability of a weapon system to the end user, or warfighter. Instead, it merely states that it ensures best value for DOD. This approach is vague and lacks focus on a very important purpose of PBL, which is to obtain necessary system readiness levels and meet warfighter needs.

Recommendation: At a minimum, add the PM and PSM into the next version of *BBP 3.0* (2015) text as responsible stakeholders critical for the implementation of PBL. In addition, adding language to link the benefits of effectively employing PBL to availability of weapon systems to the warfighter may provide compelling justification of just how important PBL is.

1.5 Define PBL and its elements: This document does not adequately define or address some of the elements of PBL that are needed to provide a clear picture of what it is. The language in *BBP 3.0* (2015) on PBL may mislead readers to believe that it is the only way to obtain support for DOD weapon systems. This supports *DODD 5000.01* (2007) and *DODI 5000.02* (2015), which both mandate that PMs employ PBL. However, this is in contrast to the ASD (L&MR) comprehensive guidance that is referenced in *BBP 3.0* (2015), which identifies that PBL arrangements may not be appropriate for all support situations (ASD (L&MR), 2013). *BBP 3.0* (2015) also does not identify any metrics that would be useful in a PBL arrangement. It also fails to capture all of the goals for using PBL. It mentions balancing cost and performance, but never ties PBL to reducing logistics footprint, improving system reliability or availability, or meeting end user or warfighter needs/requirements.

Recommendation: The DOD needs to reconcile the conflicts between the various policy documents that address PBL. ASD (L&MR)'s *PBL Comprehensive Guidance* (2013) and *PSM Guidebook* (2011) both indicate that PBL may not be appropriate for all support situations. However, *DODD 5000.01* (2007) and *DODI 5000.02* (2015) use directive language to mandate the use of PBL. This finding is emphasized in Chapter V of this thesis. *BBP 3.0* (2015) may be strengthened by including some example metrics, like those described in Chapter I of this thesis, that are common in effective PBL arrangements. Also, *BBP 3.0* (2015) can benefit from linking the benefits of employing effective PBL to the end user or warfighter. Adding language explaining the goals and how they impact DOD's overall mission could provide clearer rationale as to why PBL is DOD's preferred support strategy.

4. ASD (L&MR) *PBL Comprehensive Guidance*

On November 22, 2013, the ASD (L&MR) published the *PBL Comprehensive Guidance* (2013) memorandum on the subject of increasing effective use of PBL. The purpose of the document is to bolster the message from Better Buying Power 2.0 and help the Services better implement PBL. Although the document provides guidance, it is a policy document because it directs the services to provide details and status of PBL arrangements to senior leaders and foster education of PM and PSM professionals via DAU training courses and learning assets. This document establishes a concerted effort across DOD aimed at reviewing the efficacy of PBL arrangements and to establish a reporting chain for improved focus and communication at all echelons of the workforce across the DOD. In addition, this document tasks functional leads for acquisition career fields to inform DAU of any changes to keep PBL training current. DAU, in turn, is tasked to provide a repository of lessons learned and best practices to share with the workforce.

The *PBL Comprehensive Guidance* (2013) document also provides a definition of PBL and describes attributes of effective PBL arrangements. These attributes include the following:

- an objective and measurable description of work leading to a desirable outcome
- appropriate contract length, type, and funding approach
- appropriate metrics to produce desired outcomes
- incentives aimed at producing desired outcomes and cost reduction
- shared risks and rewards between government and commercial PSIs and PSPs
- synchronizing of support arrangements to meet warfighter requirements

This is the first official document to address whether PBL is applicable or not when planning for support for a system, which is a departure from all other policy documents that state PBL is mandatory for all support situations. It includes some specific characteristics or circumstances leading to successful PBL arrangements, as taken from previous DOD experience. It says that if a program exhibits any of these characteristics, then PBL should be considered. These circumstances include: poor system availability/performance, workload or part demand has achieved a level of predictability, there are enough support providers in a competitive market, there is adequate system operational life (five to seven years, typically) for support providers to recoup investments, commonality of parts/components across the Services or DOD provide leverage for economies of scale for providers and gives the government negotiating leverage, or support costs exceed life cycle cost estimates and an opportunity for cost reduction exists within reason.

PBL applicability for system support is further clarified by this document by providing some circumstances where it may not make sense as a product support arrangement. It suggests, for example, that newly fielded systems, especially those where little or no knowledge of the reliability of it or its components exists, may pose too much risk to be placed on a PSP (set up for failure). Another situation where PBL may not be suitable is if a weapon system is utilized in an environment or manner for which it was not intended. This would reduce predictability of a system's reliability or supportability and a PSP may not be able to meet system availability or dependability requirements. The

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topic of PBL applicability and assessing when PBL should or should not be considered is discussed further in Chapter V.

The *PBL Comprehensive Guidance* (2013) document provides a wealth of information that is helpful toward implementing PBL. However, it is deficient in the following top-level elements:

1.4 Identify Stakeholders/Roles

1.5 Define PBL and its Elements

Figure 11 shows the deficiencies of this document graphically in the model. The model also identifies some lower level elements that are addressed by this document to illustrate areas of overlap into domains where the lower level guidance of guidebooks provide similar information.
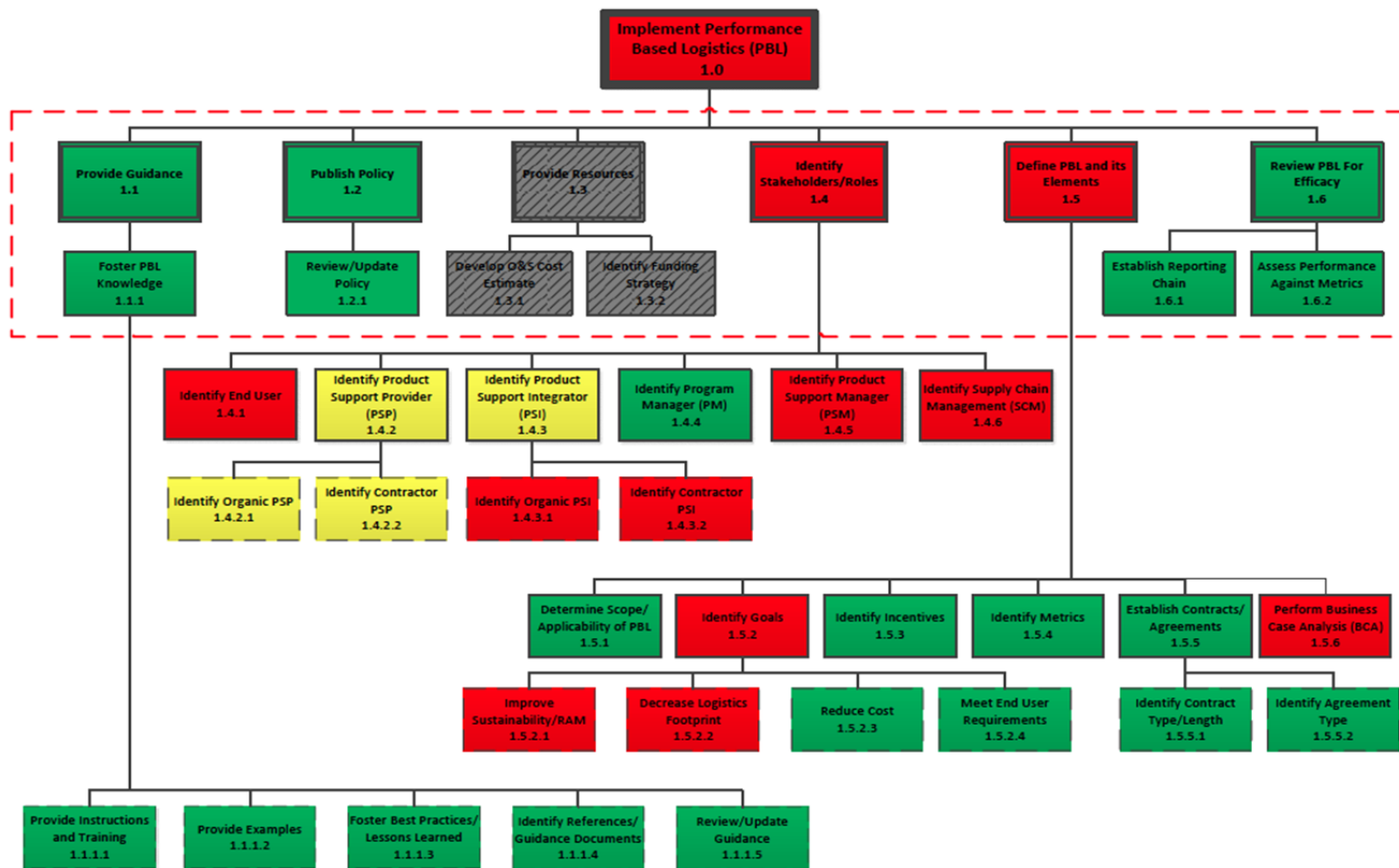
Figure 11.   Model Analysis Results for PBL Comprehensive Guidance

Gaps and Recommendations

1.4 Identify Stakeholders/Roles: This document fails to mention the PSM. The PSM is the PM's point person for implementing product support. It also fails to identify the Supply Chain Management function, as well as other functional representatives typically needed in an IPT setting to implement PBL. These other functional subject matter experts typically include contracting specialists, financial managers, legal representatives, and systems engineers.

Recommendation: No action is recommended. This policy document is a one-time publication that fills the gap between *BBP 2.0* (2012) guidance and the referenced future *PBL Best Practices Guidebook* (never published), which shortly after became the *PBL Guidebook* issued by ASD (L&MR), in May of 2014. The deficiencies noted here are remedied in that *PBL Guidebook* (2014), which is also reviewed later in this thesis.

1.5 Define PBL and its Elements: This document did not identify the BCA as an important tool to help in determining which type of product support arrangement provides best value to the PM and PSM. Including a BCA in the document could have reinforced the assessment of circumstances described that help identify whether PBL is applicable to a product support situation or not.

Recommendation: No action is recommended for the same reasons stated above. The new *PBL Guidebook* published in May of 2014 addresses BCAs and their purpose. This *PBL Comprehensive Guidance* (2013) document clarifies and supplements the policies set in *BBP 2.0* (2012) and remains an excellent reference for PMs and PSMs responsible for planning product support for programs.

D. GAPS IN GUIDANCE LEVEL DOCUMENTS

The DOD guidance level documents pertaining to PBL were published to support and clarify previously established DOD policy level documents containing PBL-related policies, such as the Better Buying Power directives, *DODD 5000.01* (2007) and *DODI 5000.02* (2015). Therefore, guidance level documents contain more lower level detail and information, as is identified in Figure 7. Thus, the gaps and recommendations will

address issues in the lower level elements and not the higher level elements like the policy documents. If any of the lower level elements are identified as deficient in the model, then the associated higher level element (elements 1.1 through 1.6) is also identified as deficient. Failure to address all elements and sub-elements in the model represents a shortfall in that document precluding it from fully assisting PMs and PSMs in implementing PBL.

1. ASD (L&MR) *PSM Guidebook*

The *PSM Guidebook*, published in May of 2011, is a guidance document specifically aimed at assisting PSMs and PMs on how to plan and execute a product support strategy. It presents a thorough approach to product support planning of which PBL is merely one of several potential outcomes. The *PSM Guidebook* (2011) focuses on Product Support Arrangements (PSAs), which can take the form of PBL, sustainment support, Contractor Logistics Support (CLS), life cycle product support, or weapon systems product support (ASD (L&MR) 2011). This is in striking contrast to the policies in *DODD 5000.01* (2007), *DODI 5000.02* (2015), and *Better Buying Power 3.0* (2015), which all mandate the effective use of PBL. This conflict in policy is a major finding that is further addressed in Chapter V.

There are several concepts introduced in the *PSM Guidebook* (2011) that assist PMs and PSMs toward developing and executing product support strategies. This document establishes the 12-Step Product Support Strategy Process Model for product support planning, which is later used as a template in planning for PBL in the *PBL Guidebook* (2014) (ASD (L&MR) 2014). This twelve-step process model is shown in Figure 12. The *PSM Guidebook* (2014) also presents the important product support planning activities that typically need to be accomplished for each major life cycle phase (ASD (L&MR) 2014). Lastly, this document presents the concept of Sustainment Maturity Level (SML), which is described as a best practice for identifying the activities that should be executed to ensure a program is developing a product support strategy to deliver the required sustainment capability when needed (ASD (L&MR) 2014). This SML concept is similar to the Technology Readiness Assessment process, which uses

Technology Readiness Levels (TRLs) to evaluate the maturity and risks associated with critical technologies in a program (Assistant Secretary of Defense for Research and Engineering 2011).

Figure 12.   The Twelve Steps of Product Support Planning (from ASD (L&MR) 2011, 34)

Although the *PSM Guidebook* (2014) describes product support planning and strategy in general and does not necessarily focus on PBL throughout the document, much of the guidance can be applied to PBL. The document contains useful guidance on determining resource needs for product support planning, including cost estimation information and various funding strategies. It also identifies stakeholders and provides a detailed description of the roles and responsibilities of key participants in the product support planning process. It also defines the elements such as product support

arrangement types, goals of product support, incentives for PSPs, as well as applicable metrics for achieving desired support outcomes (ASD (L&MR) 2011).

Overall, the *PSM Guidebook* (2014) is a good reference for product support information that may be applicable for implementation of PBL. However, it does fall short of specifically providing guidance to PSMs on how to implement PBL. In the document, product support is approached in a general sense, which does obscure PBL in the sense that PSMs have other options besides PBL as potential product support strategies. As noted before, this is in conflict with other policy documents mandating PBL as the exclusive product support approach to use. The expansion of options for product support from simply PBL or transaction-based support is stated in the guidebook for the primary purpose of meeting warfighter operational readiness needs (ASD (L&MR) 2011). In Figure 13, the model is used to depict where this document is deficient in the following element:

1.1.1.2 Provide Examples

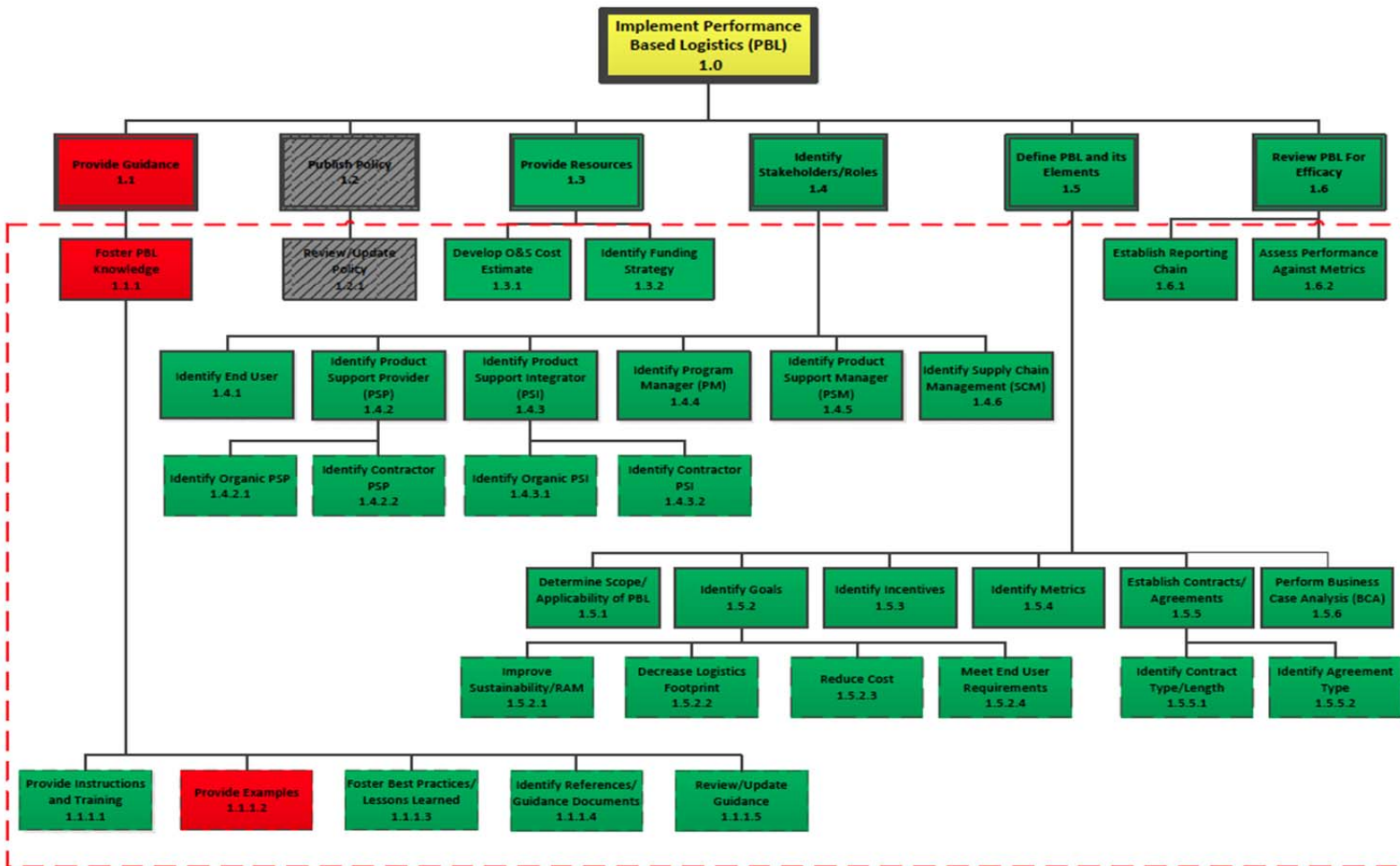Figure 13 shows the identified deficient element in the model.

Figure 13.   Model Analysis Results for PSM Guidebook

Gap and Recommendation

1.1.1.2 Provide Examples: The document did not provide any examples of programs, notional or real, to help explain how the various product support strategies could be employed. More specifically, it did not provide any examples of effective uses of PBL arrangements. Examples, especially those from empirical, real world observations, can provide invaluable insight to product support planners to help them learn how to tailor PSAs to their program's specific needs. A program may already exist in the DOD that has similar characteristics and needs, so that a PM or PSM can simply adopt like practices and do so with improved confidence that the strategy will produce the desired outcomes.

Recommendation: Add examples of Performance Based Agreements so that implementers can at least have a format to work from. Also, providing at least a notional program to guide readers through how a product support strategy, like PBL, can be achieved. The more recent *PBL Guidebook* (2014) provides a notional program example to show what must be considered when planning for PBL. However, the *PSM Guidebook* (2011) would still benefit form incorporating an example because it takes a broader approach to describing the process of planning for general product support, of which PBL is just one of the types of arrangements presented.

2.   ASD (L&MR) *PBL Guidebook*

The *PBL Guidebook* was published May 27, 2014, and represents a collaborative effort between ASD (L&MR), the Services, and DAU, to provide better guidance to PMs, PSMs and logisticians responsible for implementing PBL. This document was written to support *BBP 2.0* (2012) and the *PBL Comprehensive Guidance* (2013) documents.

The *PBL Guidebook* (2014) is the most comprehensive and descriptive document published to date for guidance on PBL implementation. Al Banghart, a senior advisor at Deloitte Consulting LLP, who has worked extensively with the Pentagon's procurement office, said of the *PBL Guidebook* (2014), "Until just last month, program offices did not have any substantive tools to help guide them through the PBL deployment process"

(Erwin 2014). The quote was obtained from a blog article written by author Sandra Erwin on May 7, 2015, posted to the National Defense Magazine website (Erwin 2014).

The *PBL Guidebook* (2014) addresses all of the elements in the model, as can be seen in Figure 14. It contains a vast amount of information beneficial to PMs, PSMs and any program-level staff involved in implementing PBL. The document identifies PBL best practices and lessons learned, as well as a thorough Question and Answer section addressing numerous topics under PBL. It also contains a useful list of references pertaining to PBL and product support in general. The document introduces a feasibility analysis that indicates whether a PBL arrangement is feasible or not for a given program. One key stand-out feature, that all other DOD guidance or policy documents fail to provide adequately, is the inclusion of relevant examples. The document contains a sample draft contract to illustrate how a PBL contract could be set up. It provides hardware-focused examples of PBL arrangements that can also serve as a guide for Major Automated Information Systems (MAIS), which are typically software intensive programs (ASD (L&MR) 2014). In addition, it provides "a notional Generic Subsystem (GSS)(that implements a PBL solution with a commercial Original Equipment Manufacturer (OEM))" (ASD (L&MR 2014, 3). This GSS example is also intertwined through the 12-Step Product Support Strategy Process Model, previously introduced in the *PSM Guidebook* (2011) and depicted in Figure 12, to show how that process can be utilized for PBL support planning.

The results of the analysis performed with the model are shown in Figure 14. All elements in the model were addressed by this document.
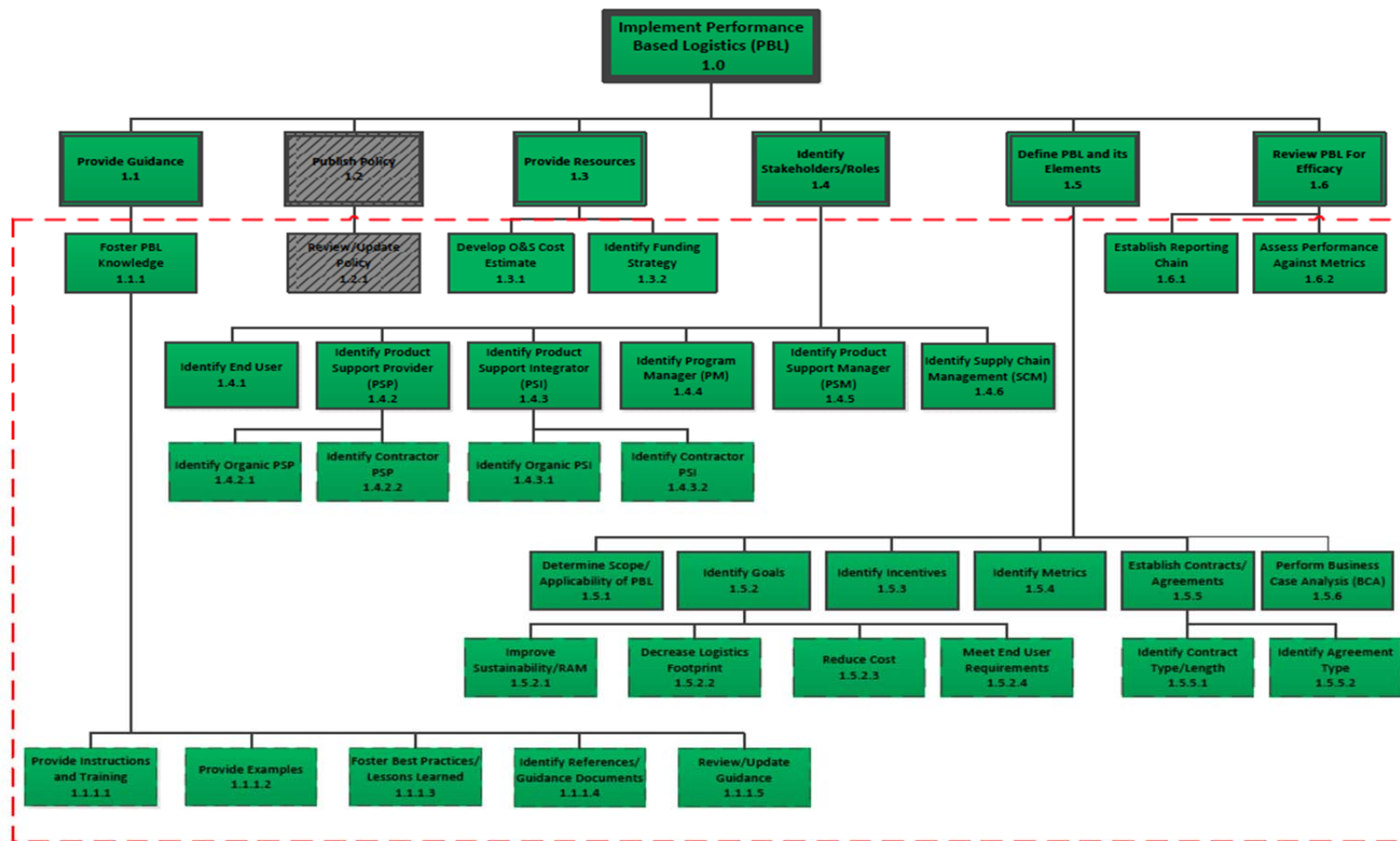
Figure 14.   Model Analysis Results for PBL Guidebook

As can be seen from the model for the *PBL Guidebook* (2014), all elements are addressed satisfactorily. So, does that mean a user of the guidebook can, without fail, successfully implement PBL for any product support requirement? Unfortunately, in practice, the solution is not that simple. The model shows that the *PBL Guidebook* (2014) is the best *enabler* by providing the most comprehensive and pertinent information about implementing PBL. However, every program's sustainment needs are unique. DAU states, "There is no one-size-fits-all approach to PBL. Similarly, there is no template regarding sources of support in PBL strategies. Almost all of DOD's system support comprises a combination of public (organic) and private (commercial) support sources" (DAU 2005, 2-4). As mentioned earlier, the *PBL Guidebook* (2014) even introduces a feasibility analysis to test whether a PBL arrangement is applicable or not to a weapon system's support needs. Also, the DAU statement introduces another issue regarding public (organic) support sources. Organic support organizations do not operate off of a profit motive like commercial contractors. Therefore, what incentives can legally be extended to an organic support provider aside from an ultimatum for them to either meet performance objectives in the PBA or, upon failure to meet the performance objectives, take the workload away and outsource it? This issue will be revisited in Chapter V as a suggested future research topic.

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V.   CONCLUSION

A.   OVERVIEW

The gap analysis and recommendations performed and provided in Chapter IV identified areas for improvement in each of the reviewed documents. Most issues included recommendations that could potentially rectify the deficiencies within that document. However, several larger, overarching issues were discovered that could not simply be attributable to one single document, but are, in fact, problems that trend across several documents. These larger issues, or major findings, are captured in this chapter along with recommendations from the author. Finally, recommendations of areas for future research are identified and discussed.

B.   MAJOR FINDINGS AND RECOMMENDATIONS

1.   *Conflicting Policies and Guidance*

A major finding through analysis of the policy documents is an inconsistent message about whether or not PBL is mandatory. Three of the four policy documents reviewed in this thesis indicated that PBL must be used to acquire product support for a DOD weapon system. *DODD 5000.01* (2007), *DODI 5000.02* (2015), and *Better Buying Power 3.0* (2015) all require PBL. Statements like "Shall develop and implement," "Will employ," and "Ensure effective use," describe the policies toward PBL in each of the three documents, respectively. The fourth policy document reviewed is the *PBL Comprehensive Guidance* (2013), which identified circumstances where PBL may not be appropriate (ASD (L&MR) 2013). This is a dramatic reversal in position of PBL being mandatory in the first three policy documents. It is critical that policy documents all be consistent with each other in order to effectively and uniformly direct implementation of PBL, or any initiative for that matter.

The *PBL Guidebook* (2014) also suggests that PBL is not the only product support strategy available for use by PMs and PSMs. It introduces a feasibility analysis to determine whether PBL meets a specific program's product support needs or not. This inherently suggests that other product support strategies, such as the classic transaction-

based approach or CLS are potential options. Of course, this is not consistent with the directive language found in three of the four policy documents. Interestingly, the one policy document that does not indicate that PBL is the only product support solution is published by ASD (L&MR). This same office published the *PBL Guidebook* (2014), which also states that PBL is simply one of several product support strategies available to the PM and PSM (ASD (L&MR) 2014). Oppositely, the three policy documents mandating PBL are all published by USD (AT&L).

Recommendation: As can be seen through the PBL-related policy and guidance documents published through the two offices, there is division between them on whether PBL is applicable or feasible for all product support needs. Policy and guidance needs to align between the two organizations to put forth a consistent and clear message about PBL implementation. ASD (L&MR) provides a convincing argument for keeping the door open for other product support strategies, especially in cases where a PBL strategy may not make the most sense. Therefore, it is the opinion of the author that policy currently mandating PBL for all product support situations be modified to allow for other product support strategies in circumstances where PBL is not feasible or optimal. Emphasis can still be placed on considering PBL where it is the best option, so long as it produces the desired outcomes that it is purported to achieve.

2. *Determining Applicability or Feasibility of PBL*

A major finding, as a result of the analysis performed, is the lack of clarity on determining whether PBL is applicable or feasible for all product support situations. The three policy documents that mandate PBL, as identified previously in this chapter, do not address this because it is not congruent with their conveyed message that PBL will be employed for all product support arrangements. The *PBL Guidebook* (2014) introduces a PBL feasibility analysis as part of a data gathering activity to help the PSM assess whether PBL will work for the program or not. It is much like a small Business Case Analysis (BCA), except the feasibility analysis outcome is binary: PBL is feasible or not. BCAs differ in that they typically are more in-depth and recommend an optimal product support strategy based on various considered alternatives. Most of the other policy and

guidance documents reviewed mention the BCA as a tool to help the PM and PSM determine which product support strategy is best for a system. The two exceptions are the *PBL Comprehensive Guidance* (2013) document and *DODD 5000.01* (2007), of which both provide no guidance at all on BCAs or on assessing applicability or feasibility of PBL for a system.

As already noted, the BCA is a tool for PMs and PSMs to determine which product support strategy achieves the optimal balance between warfighter capabilities and affordability (ASD (L&MR) 2011a). *DODI 5000.02* (2015) and *BBP 3.0* (2015) both mention BCAs. However, *BBP 3.0* (2015) only directs ASD (L&MR) to review and assess BCAs for selected and current programs that employ a PBL strategy. This neglects the BCAs for all of the other programs that do not employ PBL, which could be a good source of information for why they did not select PBL. *DODI 5000.02* (2015) mentions a BCA as a required annex to every program's Life Cycle Sustainment Plan (LCSP) (USD (AT&L) 2015a). Nonetheless, if policy is directing PBL to be employed for all programs with product support needs, then a BCA does not seem to be needed since that decision has already been made by policy. Thus, there is no consistency across the various policy and guidance documents for determining feasibility or applicability of PBL for programs.

Recommendation: A major part of this issue about applicability or feasibility of PBL stems from the previously mentioned major finding that some policies mandate PBL while one other policy document and other guidebooks offer alternative product support solutions and PBL feasibility analyses. Thus, the recommendation for this issue will be made with the assumption that the previous recommendation of modifying all policies to allow for other product support strategies is implemented. With that impediment removed, policies can then be modified to include that feasibility analyses be performed to determine if PBL is feasible or not for candidate programs. The feasibility analysis mentioned in the *PBL Guidebook* (2014) can be incorporated into the BCA as an initial step in that process to help narrow down the potential support strategy options.

3.   *Use of Examples*

Of the six policy and guidance documents reviewed, only one incorporates a descriptive example of how to implement PBL. That document is the *PBL Guidebook* (2014), which employs the Generic Subsystem (GSS) example to show how planning PBL for a hardware-based system might be accomplished, as well as providing numerous considerations and best practices for each product support planning step (ASD (L&MR) 2014). However, all of the other policy and guidance documents were completely devoid of any examples. Through the use of examples, PBL implementers can see how others have employed this complex product support strategy effectively in the past. Additionally, they can also see what has worked for PBL arrangements that have been used on programs with similar characteristics or circumstances, thus preventing others from having to "reinvent the wheel" and save valuable resources and time spent toward applying PBL, as opposed to researching and learning how to implement it anew.

Recommendation: Develop a database of records and documents from previous successful PBL arrangements and make them accessible to PMs, PSMs and the DOD community of logisticians. ASD (L&MR) is an ideal candidate organization for creating and maintaining such a database, as they are responsible for publishing guidance and disseminating information across the DOD for PBL implementation. Documenting into a common database successful PBL arrangements that may be applicable for similar programs with comparable support needs and characteristics could be beneficial to ensure useful PBL examples can be shared with other programs and stakeholders. Mr. Frank Kendall, the current USD (AT&L), has acknowledged that employing PBL arrangements can have a steep learning curve (Erwin 2014). The use of existing examples may enable quicker apprehension of PBL and promote innovative thinking among practitioners of PBL.

C.   SUMMARY OF RESEARCH QUESTIONS

In Chapter I, several research questions were posed to frame the topics and issues that this thesis would examine. These research questions and corresponding assessments, as a result of the research performed, are summarized here.

Are current and applicable DOD policy and guidance documents adequate to facilitate PBL implementation?

The policy and guidance documents addressed in this thesis are the most current and relevant sources of information for PBL at the DOD level. The results of the analysis performed in Chapter IV suggest that there are two documents, the *PSM Guidebook* (2011) and *PBL Guidebook* (2014), that contain a fairly comprehensive amount of information useful for PBL implementation. The *PBL Guidebook* (2014), in particular, satisfactorily addressed all elements in the author's PBL Implementation Model, indicating that it is the best stand-alone source of guidance for enabling PBL implementation. The reviewed policy documents all satisfy the purpose of establishing policy. However, they lean heavily on the follow-up guidebooks to provide a more thorough explanation of the PBL concept. However, it is not clear whether PBL is mandatory or not for all product support arrangements. As mentioned above in the first major finding, this inconsistency between policy documents and guidance needs to be rectified to eliminate confusion within DOD on whether it is mandatory or not. Although there is excellent information available in both guidebooks to enable implementation of PBL, the policy discrepancies must be corrected in order for DOD policy and guidance to truly be adequate.

What informational gaps exist in the current DOD policies and guidance that may pose issues for implementing PBL?

Chapter IV provided results and recommendations to the gaps identified in the analysis. Except for the *PBL Guidebook* (2014), the analysis identified informational gaps in all other reviewed documents. Finally, the major findings earlier in this chapter covered the major findings that trended across multiple documents and posed the most significant issues hindering PBL implementation.

What changes and recommendations can be proposed to close these informational gaps to better assist DOD program managers and logisticians in implementing PBL?

The changes and recommendations for the identified informational gaps are provided in Chapter IV for the specific document changes and earlier in Chapter V for the major findings that trended across the reviewed documents.

D.   AREAS FOR FURTHER RESEARCH

During this research, several areas for future study were discovered that could benefit implementers of PBL. These potential future topics either expand on some of the major findings in this thesis or consider new areas for further research that are related to PBL but are outside of the scope of this thesis.

Research potential incentives for PBL arrangements with organic (non-commercial) support providers.

Almost all of the reviewed policy and guidance documents recognize the use of both organic or commercial support providers. As noted by DAU, "Almost all of DOD's system support comprises a combination of public (organic) and private (commercial) support sources" (DAU 2005, 2). Therefore, it is critical that PBL practitioners understand how to address organic support sources in PBL arrangements. However, none of the reviewed documents mention any specific incentives or examples of PBL arrangements involving organic support providers. One researcher noted, "The best PBLs are CLS because contractors can be incentivized and penalized with money. They can be held accountable" (Coryell 2007, 85). Can organic support providers be held accountable in a similar fashion?

Provide an assessment of PBL and its overall performance as a product support strategy in DOD.

There have been several assessments of PBL in the past, including two Government Accountability Office reports, a 2006 University of Maryland evaluation (Gansler and Lucyshyn 2006), and the 2012 "*Proof Point Study*" (Boyce and Banghart 2012), that provided insight into PBL and its achievements. A new up-to-date look at

PBL may be warranted to find out if PBL is being used effectively for DOD programs and to discern if it is truly producing the desired results. It is also alarming to note, as identified in the National Defense Magazine blog article by Sandra Erwin, "Fewer than 90 PBL contracts are in place today – less than half the number that existed in 2005. Few new PBLs are being pursued, and the military services are choosing to not renew some existing PBLs" (Erwin 2014). A current total of qualified PBL arrangements in use across the DOD and how they are performing can provide additional insight into PBL's effectiveness.

Perform an analysis of Service level PBL policy and guidance (Air Force, Army, Navy, Marine Corps, etc.).

Further research into how the different services in the DOD are employing PBL may provide insight for PBL practitioners as well. The scope of this thesis looked only at DOD level policy and guidance. Implementation of PBL at the services level may identify innovative approaches to buying product support.

Objective assessment model for validating feasibility of PBL for product support needs.

Another potential area of exploration is the concept of validating feasibility of PBL to a system's product support needs. The PBL Guidebook introduced a feasibility analysis to determine whether PBL is feasible or not for a weapon system (ASD (L&MR) 2014). The development of a model or checklist to guide PMs and PSMs through a validation process to determine whether PBL is feasible for their program could be very useful. Part of the analysis could be to determine what conditions or circumstances indicate whether PBL is feasible or not. The *PBL Comprehensive Guidance* (2013) document provides two sample circumstances where PBL may not be the appropriate product support strategy (ASD (L&MR) 2013). It is the author's opinion that there may be other circumstances where PBL may not make sense, such as a product support arrangement with a small business that cannot assume the level of risk associated with PBL arrangements, or a weapon system that has high levels of reliability/availability and reasonable support costs through traditional sustainment arrangements. Thus, a model or

checklist that addresses many different circumstances or conditions as part of the validation process would assist product support planners to better determine whether PBL is feasible or not for their weapon system.

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